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Message from the Editor-in-Chief

Dear Colleagues,

TOJSAT welcomes you. TOJSAT would like to thank you for your online journal interest. The online journal system has been diffused very fast for last ten years. We are delighted that almost 160,000 educators, teachers, parents, and students from around the world have visited for seven years. It means that TOJSAT has continued to diffuse new trends in science and technology to all over the world since January, 2011. We hope that the volume 8, issue 1 will also successfully accomplish our global science and technology goal.

TOJSAT is confident that readers will learn and get different aspects on science and technology. Any views expressed in this publication are the views of the authors and are not the views of the Editor and TOJSAT.

TOJSAT thanks and appreciate the editorial board who have acted as reviewers for one or more submissions of this issue for their valuable contributions.

TOJSAT will organize ISTEC-2018- International Science & Technology Conference (www.iste-c.net) in Paris, France. This conference is now a well-known science and technology event. It promotes the development and dissemination of theoretical knowledge, conceptual research, and professional knowledge through conference activities. Its focus is to create and disseminate knowledge about science and technology. ISTEC-2017 conference book has been published at http://www.iste-c.net/istecpubs

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TOJSAT is guided by it's editors, guest editors and advisory boards. If you are interested in contributing to TOJSAT as an author, guest editor or reviewer, please send your cv to editor.

January 01, 2018
Prof. Dr. Aytekin ISMAN
Sakarya University

Message from the Editor

Dear Tojsat Readers,

Seven years were past since we published the first issue of The Online Journal of Science and Technology. Now, we start to read 8th volume of The Online Journal of Science and Technology. We finished the Istec 2017 conference hold in Berlin, Germany and Chicago, U.S.A. Contributed papers during the Conference were received interests from all over the areas of Science and Technology. The selected, peer-reviewed papers were accepted for publication from contributions from all over the World for both Conferences. The accepted and published papers are from Literacy to Computer Engineering.

Prof.Dr. Mustafa S. Dündar

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Table of Contents

ACCESSIBILITY FOR INCLUSION AND WELL-BEING IN THE CLASSROOM

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Abstract: This paper is a discussion of technology and teachers preparation about classroom management, differentiation and inclusion. Recently the role of teaching and educating the youth has become more difficult then in the past. In the classroom leave all togheter: students with different approaches to learn, students with disabilities and special needs or dyslexia. Every student needs a specific approach to have a good experience at school. The role of teachers is central to promote inclusion, access, creativity for all and also well-being in the classroom. Every student deserve a teacher who understand the power of UDL (Universal Design for Learning) and Technology that allows to every student to overcome their difficulties determined by their disabilities. Technology can support teachers to teach more inclusively and represent a tool to promote effective learn for all. Technology solutions, in fact, allow to personalize the approach to learning and make the teaching and learning process more interactive and immersive. When students are more engaged they are more motivated and, consequently, they perform better.

Keywords: Accessibility, Inclusion, Special Education, Technology

Introduction

Nowadays educating the youth has become more difficult then in the past: classroom management is a challenge that many teachers constantly face (Carruba, 2016). They must be ready to guide all students in the class, also students with disabilities or difficulties, to be able to learn, to work hard and become their best version, to take part to the lesson and the teaching-learning process, to be motivated and interested.

Schools must be inclusive and able to promote social equity: to achieve these goals, schools deserve teachers able to include all students, to promote a context where everyone can be active and pro-active, to find solutions to overcome their students' difficulties determined by their disabilities. The role of teachers is getting harder especially considering the complexity of today's society. In today's difficult situation, classroom management can be a solution to support teachers to teach in the best way and represents a set of effective strategies to guide the class and promote the interests of all students also in order to respect the values of the Universal Design for Learning (Carruba, 2016). Theachers, as more studies have shown, play a fundamental role in the cognitive, social and emotional development of their students and thanks to classroom management strategies they allow every student to really learn and to improve their skills. A positive classroom environment encouraging effective teacher-student relationships.

Evertson and Weistein (2016) describe the classroom management as a set of actions to support every students in the learning process. They explain five actions that allows teachers to manage successfully the classroom:

1. developing supportive relationships with and among students;
2. organizing the activity and giving clear instructions;
3. using group management and cooperative learning methods;
4. employing appropriate interventions to support students with behavior problems;
5. promoting an ongoing interaction between teachers and their students.

The classroom management is not only a way to teach but, as Kounin wrote, give to teachers a set of strategies to promote students' engagement based on these techniques:

- withitness (teachers' ability to know what was going in classroom);

- overlapping (being able to present a new topic while preventing misbehaviors);
- momentum and smoothness (to be able to "roll-with-the-punches" and to keep on a plan or course action);
- focus group (the ability of teacher to engage the whole class).

In addition, in effectively managed classrooms it is necessary to establish:

- clear rules and procedures;
- disciplinary interventions;
- teachers-students relationships;
- mental set   (that includes two aspects: 'withitness' and 'emotional objectivity') .

All these strategies allow teachers to catch students' interest e promote learning.
In the classroom, nowadays, we have students that live continuously in a digital context and spend more time using technology in their daily living. In recent years, digital skills has become important also in the schools.
How is possible use technology solutions in the classroom during the lesson?
How technology can support teachers and students in the teaching-learning process?
How technology can promote inclusion and can support students with disabilities or difficulties?

These questions moves the pedagogical reflections about the partnership technology- education.
Technology and Special Education can work together having focus on:
- users experience;
- accessibility;
- classroom and learning context design;
- creativity for all.

Furthermore, technology allows moreover to differentiate the activities according to specific students' need. Using technology, teachers can help students with disabilities, students with dyslexia, students that have different approaches to learning. That's why it is important to apply different technology tools for education so that each teaching style can match each individual learning style.
Nowadays, technology is present in schools but, as some studies prove, often teachers didn't receive a correct training and so they're unable to use these tools in the most appropriate way; on the other side, also students are able to use technology for their free time, but lack the essential skills to apply technology to the learning process. Technology changes the way to learn if teachers use it with an inclusive approach.
When students with disabilities thanks to technology overcome their difficulties, they feel better in the classroom and, it works good also for teachers. Technology could provides innovatives solutions for mobility, hearing speech and other everyday needs and support students with disabilities enjoy the most active role in the classroom.
Every school deserve technology but not because it is the New or because it is fashionable... but because it could be the future for the inclusion.

Materials and Methods

This research focuses on:
1. Classroom management;
2. Differentiation and Universal Design for Learning;
3. Special needs, Technology and inclusion in the classroom.

Using technology for inclusion every schools could be a place for social equity and allow students, also with disabilities or disturb, to really learn, to be able to develop transversal life skills, to find opportunity to be active and feel well in every context.

Goals of the study:
- Analysis of education technology policies and legislation in Italy;
- Analysis of teacher competences and knowledge on the use of educational technology for increased inclusive education;
- Comparative studies with UK and USA about AT;
- Know-how Neuroscience: how technology impacts on the whole learning process and the perception of self-competence in students with disabilities including learning disabilities;
- Analysis of accessible technology.

Methodology:
- Research tools: questionnaire and interviews;
- Population: primary , middle and secondary schools, Universities, teachers, parents, students (In Italy)
- About comparative studies in USA and UK: personal experience and research collected.

Results and Discussion

In the field of education, the well-being of students is a necessary condition to make them feel included, accepted, part of the class and therefore ready to learn.
Expected results:
- Identify educational technology suitable and effective for students with disability;
- Identify educational technology to supports teachers in implementing inclusive education;
- Identify mobile apps relevant for inclusive education and classify them according to different factors: disability, activities(writing, reading, calculating, daily life...etc etc);
- Best practices on how to use educational technology as a facilitator tool in inclusive education.

Technology isn't the only solution to difficulties we are facing in schools nowadays, but might be one of the solutions that teachers can apply in their didactical activities. Technology is a good way for, and it is therefore important for teachers to learn to use it. Technology is not very widespread in schools: this happens because teachers lack the right tools (or maybe an internet connection), because they lack the right skills or just ignore the full potential of technology. In the hands of a well-trained teacher, technology, allows to achieve a school opened to everyone, also for students with disabilities or specific needs.
In recent years more researcher in different discipline has become interested in technology. One need only think, for example:
- Psychology and human and computer interaction;
- STEM (Science, Technology, Engineering and Math) education and the lack of competitiveness;
- Cultural anthropology and relationship technology / "homo faber";
- Education and technology for learning;
- Special Education and technology for inclusion.

One charpter in my research talk about iPad for inclusion. Nowadays more italian schools use iPad in the classroom. Sometimes thanks to some teacher who loves technology or has understand the power of technology in the teaching-learning process.
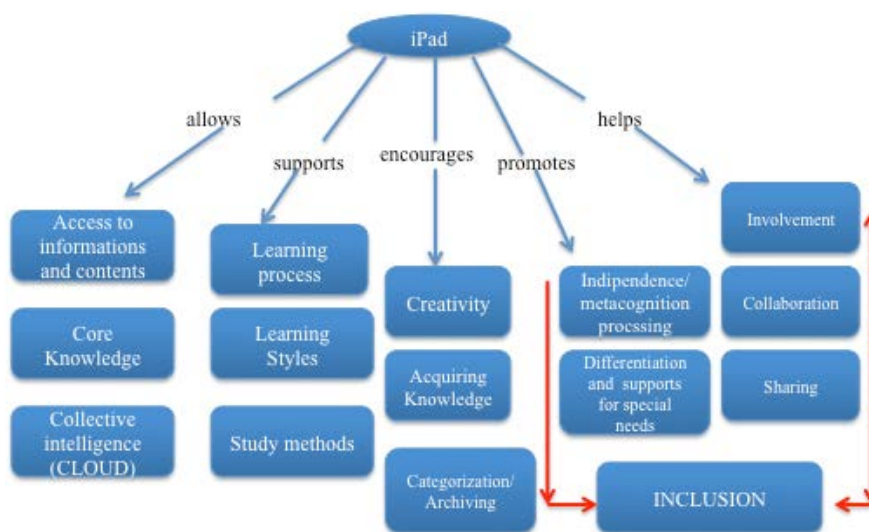
Fig. 1 Ipad inclusive and pedagogical approach

Samples:
- 2 classes of Primary School;
- 2 classes of Middle School;
- 2 classes of Secondary School.

The team chooce the classes using this prerequisites:

- teachers used iPad for 2 years at least;
- teachers have good preparations in classroom management;
- in the classroom there's students with special needs;
- Teachers started a collaboration with our Research Center (CeDisMa), to be sure they have the same pedagogical approach about inclusion.
- Project started with a meeting when I explained to all teachers Accessibility session in the iPad (visual impariments, hearing impaiments, motor disability, dyslexia and other). Pratical session to introduce iPad to support all students, including students with disabilities.
- Training Areas:
- Presentation of the contents during the teaching-learning process;
- Taking notes;
- Making concept map;
- Using creativity;
- Monitoring/ Considering/ Evaluating.
- The Tools to support theachers during the project are:
- Teachers' Inclusive lesson plan template;
- Monitoring plan for students;
- Guidelines that help them in using the tools (including icon tools).
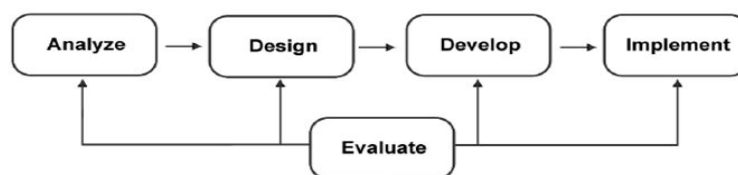
Fig. 2 Reference model ADDIE

This is a model borrowed from Engineering and Instructional Design, that fits really good in the teaching-learning process through technology. Also teachers, in fact,   need to identify customers (students) needs.

Current State:

- 61 Teachers' Inclusive lesson plan template received as below:
  - 30 from Primary School
  - 23 from Secondary School
  - 8   from Upper Secondary School;
- 698 Monitoring plan for students received as below:
  - 416 from Primary School
  - 180 from Secondary School
  - 102 from Upper Secondary School

Sythesis about the analisys of data collected until July 2017:

1. Both Teachers and Students feel more competent during the teaching- learning when schools use inclusive approach;

2. iPad isn't the only solution to difficulties we are facing in schools nowadays, but might be one of the best solutions that teachers can apply in their didactical activities;

3. Accessibility section allows all students, also with special needs, to differentiate and to customize the contents as they deserve;

4. Accessibility section allows all teachers to meet students needs and to avoid to prepare the same content in more different ways. One tool, more ways to learn.

Conclusion

In the classroom live all togheter:
- students with different approaches to learn;
- students with disabilities;
- other special needs;
- Learning disabilities or dyslexia.

Every student needs a specific approach to have a good experience at school. The role of teachers is central to promote inclusion, access, creativity for all and also wellbeing in the classroom.

Every student deserves a teacher who understands the power of UDL and Technology that allows to every student to overcome their difficulties determined by their disabilities.

Technology can support teachers to teach more inclusively and utilize a tool to:
- promote effective learn for all;
- allow to personalize the approach to learning:
- make the teaching and learning process more interactive and immersive.

When students are more ingaged they are more motivated and, consequently, they perform better.

Also students with disabilities or disturb deserve to be included, motivated, supported and to have a chance to enjoy their life. Despite disabiliry or disturb.

In the field of Special Education, researchers and teachers deserve a technological and digital competence to improve their students' with special needs skills to use technology in the school, at home, and also in daily living. Using technology allow teachers to be able to support their students, also students with disabilities in an inclusive and innovative way. The integration of technology into science curricula is a way to enhance or support student learning (Hoda et all, 2016) and for teachers who must learn how to implement and promote productive use of these in the classroom (Lawless & Pellegrino, 2007). In the Mishra & Koehler' vision (2006) , technological and digital competence is a fundamental skills for teachers to be successful and promote inclusion.

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ADOPTION OF PRECISION AGRICULTURE TECHNOLOGIES IN DEVELOPED AND DEVELOPING COUNTRIES

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Abstract: Precision Agriculture (PA) deals with the fine-tuned management of the agricultural inputs including, seeds, fertilizers, water, pesticides, and energy to create savings on these inputs, increase yield, augment profitability and conserve the environment. PA technologies include soil mapping, variable rate application (tillage, seeding, fertilizing, irrigation, and pesticide application), yield monitoring mapping, automatic guidance, and autonomous vehicles. Many factors affect the adoption of PA technologies including features of the farms, affordability and profitability of equipment, characteristics of the technologies such as complexity and compatibility, personality and family structure of the farmer, legal affairs, and institutions offering support on these technologies. The level of adoption is variable in different countries as well as in different regions in a particular country. The aim of this paper was to review the studies on the adoption of PA in developed and developing countries and compare their adoption rates. The PA adoption has an increasing trend in developed countries, particularly in the US while significant increase is also observed in other developed countries. Also, PA technologies are introduced in some developing countries including Turkey in recent years. In both developed and developing countries, auto guidance is more adopted in the last decade while yield monitoring and variable rate application was more dominant earlier.

Keywords: Precision agriculture (PA), Adoption, Developed countries, Developing countries.

Introduction

Technological developments in agricultural sector yield better management practices resulting in more precision in agricultural operations from tillage to harvesting to reduce inputs, increase profits, and protect environment (Ess & Morgan, 2003; Rains & Thomas, 2009). The term Precision Agriculture (PA) or precision farming comprise these improved management technologies such as soil sensing and mapping, yield monitoring and mapping, satellite-based positioning, remote sensing, field and crop scouting, geographical information systems (GIS), variable rate application, and automatic steering (Ess & Morgan, 2003; Rains & Thomas, 2009) (Table 1).

Table 1: Precision Agriculture (PA) technologies

Data Collection Technologies	Data Process & Decision MakingTechnologies	Application Technologies
Soil sampling and mapping	Geographical info systems (GIS)	Variable rate application
Yield monitoring and mapping	Agricultural mapping software	Section control
Global satellite positioning (GNSS)	Economical analysis	GNSS-based guidance
Remote sensing	Geostatistics	Agricultural robots
Field / crop scouting	Modelling	

Awareness and adoption rate of PA technologies are affected by many factors including characteristics of the farms, personality and family structure of the farmer, features of equipment, characteristics of the technology, legal affairs, social interaction, etc. (Table 2).

Farmers adopt and use PA technologies for specific benefits. For instance, in England, surveyed farmers reported that they use PA technologies mostly for improving accuracy (%76), reducing input costs (%63), improving soil conditions (%48), improving operator conditions (%36) and reducing greenhouse gas emissions (%17) (DEFRA, 2013). Also, reasons for not using PA included being not cost effective and/or high initial setup costs (47%), being not suitable for type or size of farm (28%), being too complicated to use (27%), and not accurate enough (2%) (DEFRA, 2013). Keskin et al. (2017) reported that the farmers using tractor auto guidance in the Adana province of Turkey had such benefits from this technology as creating straight crop rows (98.2%), flexible working hours (92.7%), time saving (80.0%), fuel saving (80.0%), labor saving (50.9%), agricultural input saving (18.2%) and yield increase (14.5%). In the same study, farmers did not want to use other PA technologies mainly due to not having detailed knowledge (54.5%), satisfaction with the available technology (23.6%), high equipment cost (18.2), and complication of the technology (3.6%) (Keskin et al. 2017).

Table 2: Factors affecting the adoption level of PA technologies

Factor	Explanation	Source
Personality of the farmer	Age, education, gender, personality, computer usage, willingness to take risks	Daberkow and McBride (2003) Edwards-Jones (2006) Lowenberg-DeBoer and Griffin (2006)
Family structure of the farmer	Work status (full time, part time, retired), availability of extra job, job of the spouse	Edwards-Jones (2006)
Features of the farm	Farm size, farm type, indebtedness, soil texture, field variability	Isgin et al. (2008) Paudel et al. (2011)
Social interactions	Local cultures, social milieu, attitude of trusted friends	Edwards-Jones (2006) Kutter at al. (2011)
Sufficiency of classical methods	Sufficiency satisfaction of classical methods used currently by the farmer.	Paudel et al. (2011)
Supporting institutions and firms	Numbers and structures of supporting institutions and firms (dealers, technical supports, consultants)	Edwards-Jones (2006) Fountas et al. (2005)
Legal issues	Rules and laws encouraging new technologies to reduce chemical inputs, to favor environment protection, sustainability	Edwards-Jones (2006)
Economic factors	Cost of equipment, return of investment time, profitability, possibility of renting	Whipker & Akridge (2009) Paudel et al. (2011)
Features of the technology	Availability, amount of time taking to learn the usage of equipment, easiness of usage, availability of technical support, complexity of the system, compatibility among different brands and models	Fountas et al. (2005) Edwards-Jones (2006) Paudel e al. (2011) Kutter et al. (2011)
Advertisement	Exhibitions, fairs, seminars, workshops, demonstration farms, field days	Kutter et al. (2011)
Technical staff	Quality and quantity of the technical staff, higher labor costs, availability of technical staff, closeness of technical staff	Whipker & Akridge (2009) Kutter et al. (2011)
Multidisciplinary cooperation	Availability of cooperation among engineers, agronomists, scientist	Ess (2002)
Decision support systems	Easiness of data processing, easiness and accuracy of decision making	Fountas et al. (2005)

The objective of this article was to review the studies on the adoption of PA technologies in developed and developing countries and compare the similarities and differences in adoption pattern.

Materials and Methods

In this study; literature was collected on the adoption rate of Precision Agriculture (PA) technologies in different countries. Scientific articles, reports, books and relevant web pages found after the review process were studied and information on the adoption of PA technologies in different countries was compiled.

The countries are divided into two groups as developed countries and developing countries based on United Nations classification (UN, 2014). The data are summarized in tables to make the data more readable and comparable.

Results and Discussion

a) Adoption Level of PA Technologies in Developed Countries

Adoption level of Precision Agriculture (PA) technologies in the US and in other developed countries was summarized in Table 3 and Table 4, respectively. The countries were listed in an alphabetical order in the tables.

The US is a leading country in many innovative technologies. This is valid for the PA technologies as well. Fountas et al. (2005) reported that about 90% of the yield monitors in the world were operated in the US (Table 3). The adoption rate of automatic guidance technology in some states / regions reaches to about 60-80% recently (Table 3) (Erickson & Widmar, 2015; Miller et al., 2017). While yield monitoring technology and variable rate technology was more dominant earlier (Norwood & Fulton, 2009; Schimmelpfennig & Ebel 2011), the auto guidance systems and automatic section control systems caught more popularity in the last decade (Holland et al, 2013; Erickson & Widmar, 2015; Miller et al., 2017).

GNSS-based automatic guidance systems offer many benefits to the farmers including more accurate field works, higher operation speeds, easy operation, working at night, less affection by bad weather, reduced operator fatigue, low setup time, reduced overlapping, reduced skips, working without foam markers, and reduced inputs (fuel, fertilizer, pesticides, seeds, etc) (Grisso et al. 2009). In the near future, auto guidance could be considered a standard feature for new high-powered farm tractors. Furthermore, driverless autonomous tractors are currently being tested in some developed countries particularly in the US.

Along with the US, Australia, Canada, and some European Union countries including Germany, Finland, Denmark and Sweden has some level of adoption for PA technologies (Table 4). Particularly, Leonard (2014) reported that about 80% of the grain growers use automatic guidance in Australia. Also Steele (2017) indicated that 98% of surveyed farmers used GPS guidance in western Canada. Main similarity among these three countries (the US, Australia, Canada) is that the farm sizes are bigger in these countries making the farmers more willing and able to adopt new technologies. Farm size is one of the most crucial factors affecting the PA technologies (Keskin 2013; Keskin & Sekerli, 2016). In general, farmer having at least a few hundred hectares are most likely to adopt high cost new technologies. Fountas et al. (2005) stated that farmers with fields larger than 300 ha tend to be the first to invest in new technologies while Paustian and Theuvsen (2016) reported that.having a farm of less than 100 ha and producing barley were factors that exerted a negative influence on the adoption of PA in Germany. Keskin et al. (2017) reported that majority of the farmers (56.4%) using tractor auto guidance in the Adana province of Turkey had a field size of bigger that 100 ha.

b) Adoption Level of PA Technologies in Developing Countries

Adoption level of Precision Agriculture (PA) technologies in developing countries was presented in Table 5 where the countries were listed in an alphabetical order. Similar observation is valid for the developing countries as well. While yield monitoring technology and variable rate technology was more dominant earlier, the auto guidance systems caught more popularity in the last decade (Table 5).

Argentina, Brasil, South Africa and Turkey are among the ones employing some level of PA technologies. It should be noted that there could be other countries that were not reported in publications and still use PA technologies.

Table 3: Adoption level of PA technologies in the USA

Country / Region / State	Technology & Its Adoption Level	Source
USA	About 90% of yield monitors in the world were in the US; in 2003, there were around 45.000 combines with yield monitor; about 46% of corn, 36% of soybeans and 15% of wheat was harvested by combines with yield monitor	Fountas et al. (2005)
USA / Ohio	36% of farmers participated in survey used at least one PA technology	Isgin et al. (2008)
USA	28% of US corn planted acres (in 2005), 10% of winter wheat (in 2004), and 22% of soybeans (in 2002) were harvested with a combine with a yield monitor.	Griffin and Erickson (2009)
USA	54% of the farmers used one or more PA technologies; yield monitoring (32%) and auto steering (32%)	Norwood & Fulton (2009)
USA	85% of agricultural dealers used at least one PA technology	Whipker & Akridge (2009)
USA / 12 states	About one-third of the cotton farmers (34%) adopted PA technologies	Paudel et al. (2011)
USA / Corn Belt region	Yield monitoring on over 40% of US grain acres; GPS maps on 24% corn acres; variable-rate technologies (VRT) on 16% of corn acres; GPS maps on 17% corn acres; VRT on 12% of soybean acres; and nationally VRT 12% for corn and 8% for soybeans	Schimmelpfennig & Ebel (2011)
USA / 34 states	Mostly-offered-technologies by surveyed dealerships were GPS guidance systems with manual control (light bar) (65%) and automatic (autosteer) control (61%)	Holland et al (2013)
USA	Three most popular technologies were GPS guidance with auto control / autosteer (83%), GPS-enabled sprayer section control (74%) and GPS guidance with manual control (63%); 82% of the dealers offered PA services	Erickson & Widmar (2015)
USA	Over 60% of agricultural-input dealers offer variable-rate-technology (VRT) services, but USDA indicate despite subsidies and educational efforts, less than 20% of corn acreage is managed using VRT. About 40% of fertilizer and other chemicals are applied with auto guidance.	Lowenberg-DeBoer (2015)
USA	About 25% of peanut farms adopted GPS soil mapping and over 40% used auto steering; variable rate fertilizing had a higher adoption rate in peanut production at over 20% of farms than for many other crops	USDA (2015a)
USA	60% of rice farms adopted yield monitoring technology and about 55% used auto guidance systems	USDA (2015b)
USA	In a survey of nearly 200 strip-till farmers, 79.4% use RTK GPS correction; use of variable-rate fertilizing increased to 36.2% in 2015 from from 31.5% in 2014; use of implement guidance was 19.7%.	Zemlica (2015)
USA / 14 states	In the 2005 survey, 23% of cotton producers used GPS guidance as in 2013 survey, about 31% adopted auto section control and 59% auto guidance systems.	Velandia et al. (2016)
USA	Until 2000s, adoption of different PA technologies varied up to 22% across major field crops. Tractor guidance grew faster than variable-rate application for all major field crops over the last 10 years.	Schimmelpfennig (2016)
USA / Kansas	66% of surveyed farmers used automated guidance and 47% use automated section control	Miller et al (2017)

Table 4: Adoption level of PA technologies in other developed countries

Country / Region	Technology & Its Adoption Level	Source
Australia	30% of broadacre crops are sown and/or sprayed using GPS guidance. Other PA technologies such as yield mapping and variable rate is less common with <1% of adoption.	McCallum and Sargent (2008)
Australia	About 800 yield monitors were used in the country in the 2000 harvest year.	Mondal and Basu (2009)
Australia	Variable rate technology adoption in 2008–2009 has increased significantly to 20% nationally	Robertson et al. (2012)
Australia	80% of the grain growers use automatic guidance technology	Leonard (2014)
Canada	Based on a survey in 2006, 23.2% of farms use GPS equipment or products, 77.9% use guidance systems, 23.5% use variable rate fertilizer application and 27.4% use variable rate pesticide application	Haak (2011)
Canada / Western	98% of surveyed farmers used GPS guidance, 84% at least one PA technology, 84% had combine with yield monitoring capability, 73% used auto section control, 75% intend to use more PA in the future	Steele (2017)
Europe	70% of all fertilizing and spraying machines are equipped with PA technologies and smart or ISO-Bus enabled equipment.	Armagan (2016)
Europe	Despite the wide range of PA solutions being offered, only 25% of EU farms use technologies with a PA component.	EPRS (2016)
Europe / Denmark Britain, Sweden, Germany	About 400 Danish, 400 British, 300 Swedish and 200 German farmers adopted yield monitors by the year 2000	Fountas et al. (2005)
Europe / England	Ratio of farms using GPS increased from 14% to 22%, soil mapping from 14% to 20%, variable rate application from 13% to 16% and yield mapping from 7% to 11% in 2009 compared to 2012.	DEFRA (2013)
Europe / France	150 000 ha are managed using PA. 50% of the arable crop holdings have a tractor with a console, an essential tool for PA. One in four modulates inputs of fertilizers and crop protection products.	Invivo (2016)
Europe / Germany	Between 6.6% and 11.0% of surveyed farmers used PA mainly for data collection techniques such as GPS-based area measurement and soil sampling	Reichardt et al. (2009)
Europe / Germany, Finland, Denmark	36% of the surveyed farmers had previous experiences with PA technologies	Bligaard (2013)
Europe / Sweden	Nitrogen sensors are used in about 20% of wheat fields primarily for nitrogen fertilizer application	Söderström (2013)
Europe / UK	Around 60% of UK farmers already use some sort of precision agriculture on their farms, although for the most part this simply means using GPS tractor steering	Norris (2015)
Japan	In rice farming, ground vehicles spray about 22% (in 2014) and the proportion of large-scale UAV plant protection has reached 36%.	Liao (2017)

Table 5: Adoption level of PA technologies in developing countries

Country / Region / State / Province	Technology & Its Adoption Level	Source
Argentina	There were about 560 yield monitors in 2001; about 4% of the grain and oil seed area was harvested by combines with yield monitors.	Mondal and Basu (2009)
Argentina	Yield monitors, positioning systems (GPS), auto guidance, and satellite images are increasingly used; it is the second country after the US with number of yield monitors (1200) and fifth country with yield monitor density of 51 monitors per million hectares (after the US, Denmark, Sweden, and Great Britain).	Bongiovanni & Lowenberg-DeBoer (2005)
Brasil / Sao Paulo state	58% of domestic and 38% of foreign sugar and ethanol companies adopt PA; most preferred technologies are satellite imaging (76%), auto pilot guidance (39%), geo-referenced soil sampling (31%), and variable rate fertilizing and liming (29%).	Silva et al. (2011)
Brasil	Mostly accepted technologies by the survey participants were GPS guidance with manual control (89%), GPS guidance with auto control (56%) and yield maps (56%).	Borghi et al. (2016)
Brasil	Adoption rate of PA is estimated at about 20% with a very diverse distribution. Soil sampling is the most adopted one. Some technologies like GPS guidance have larger adoption than others.	Albuquerque (2017)
China / Heilongjiang province	Tractor auto guidance was the most accepted technology and about 25% of the farmland was managed using PA	Verma (2015)
India	Leaf color chart (LCC) based N management and laser based land leveling are effective tools in rice farming.	Mondal and Basu (2009)
Kazakhstan*	Several auto guidance systems were introduced into agriculture.	Samruk-Kazyna. (2017).
Russia*	PA came to Russia about eight years ago. It is adopted slowly due to the high costs. Some elements of PA such as navigation on combines and cultivators are used.	Anonymous (2013)
South Africa	The number of yield monitors increased to more than 600, variable rate lime applications to 244, manual guidance systems to 200, and auto guidance to 60	Helm (2005)
South Africa	About 15 farmers used yield monitoring system in the 1999–2000 crop season	Mondal and Basu (2009)
Turkey	About 500 combine harvesters (about 3% countrywide) are equipped with yield monitoring systems	Keskin & Sekerli (2016)
Turkey	About 310 combine harvesters are equipped with yield monitors. About 110 automatic steering systems and 25 steering assistance systems were sold to the farmers. Number of variable rate applicators is less than 20.	Akdemir (2016)
Turkey / Adana province	About 110 farmers use GNSS-based auto guidance systems in Adana province.	Keskin et al. (2017)
Turkey	About 60 cotton harvesters (about 6% countrywide) are equipped with yield monitoring systems.	Erzurumlu (2017)

* These countries are classified as "Economies in transition" (UN 2014)

Conclusions

Precision Agriculture (PA) technologies provide better management practices resulting in more precision in agricultural operations from tillage to harvesting to reduce inputs, increase profits, and protect environment.

Adoption rate of PA technologies is in an increasing trend in some developed and developing countries. The auto guidance systems caught more popularity in the last decade while other PA technologies such as yield monitoring technology and variable rate technology was more dominant earlier in both developed and developing countries.

The US is the only leading developed country in the adoption of PA technologies. Other developed countries adopting PA technologies the most are Australia, Canada and European countries. Regarding the developing countries, countries such as Argentina, Brasil, South Africa and Turkey have an increasing adoption rates in the last decade.

One of the most important factors in favor of the adoption of the PA technologies is farm size. It can be said that the countries with bigger farms such as the US, Australia, Canada, Brasil, and Argentina tend to adopt these technologies in a bigger margin.

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ADSORPTION OF SUNSET YELLOW FCF ONTO MCM-41

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Abstract: MCM-41, one member of the mesoporous molecular sieves M41S family, possesses a high surface area, high pore volume and a regular hexagonal array of cylindrical pores, which is largery used in selective adsorption, chemical sensors and nanotechnology. Recently, MCM-41 has been used to adsorb dye from aqueous solution. Sunset Yellow FCF is used in food, pharmaceutical and cosmetics industries. Many dyes are toxic and carcinogenic and pose a serious hazard to aquatic living organisms. The adsorption of Sunset Yellow FCF food dye from aqueous solutions by MCM-41 was studied through adsorption isotherms. The effects of adsorbent dosage, contact time and temperature were investigated. Langmuir and Freundlich adsorption models were applied in order to describe the experimental isotherms and isotherm constants.

Keywords: MCM-41, Adsorption, Food Dye, Sunset Yellow CFC, Isotherm, Langmuir, Freundlich.

Introduction

Dye wastewaters are discharged by a wide variety of sources, such as food plants, textiles, printing, dyeing and dyestuff manufacturing. There are more than 100,000 commercially available dyes with over 700,000 tons produced annually. It is estimated that more than 70,000 tons of dye are discharged from textile industries in the world every year. They are the important sources of water pollution due to some dyes and their degradation products may be carcinogens and toxic to mammals (Lee et al. 2007; Erdogan and Oguz Erdogan, 2016). Porous adsorbents are of scientific and technological interest because of their ability to interact with atoms, ions and molecules. Since the discovery of M41S family in 1992, mesoporous materials have attracted intense interest due to their large specific surface areas, well-defined pore structures, inert framework and non toxicity (Boukoussa et al. 2017). MCM-41 molecular sieves have been widely studied because they are promising as adsorbents for removal of environmental pollutants, catalysts and catalyst supports (Sun et al. 2016).

The main objects of this study are: (i) to characterization MCM-41, (ii) to study the feasibility of using the MCM-41 for the removal of sunset yellow dye, (ii) to determine the various parameters affecting sorption, such as contact time, amount of adsorbents and temperature, (iii) to determine the applicability of various isotherm models ((i.e., Langmuir and Freundlich) to find out the best-fit isotherm equation, and (iv) to determine thermodynamic and kinetic parameters and explain the nature of adsorption.

Materials and Methods

Adsorbate

The commercial food dye Sunset Yellow FCF ($C_{16}H_{10}N_2Na_2O_7S_2$, molecular weight 452.37 g/mol, C.I. 15985, λmax=482 nm, chemical structure shown in figure 1) was supplied by Sigma-Aldrich. Distilled water was used to prepare all solutions.
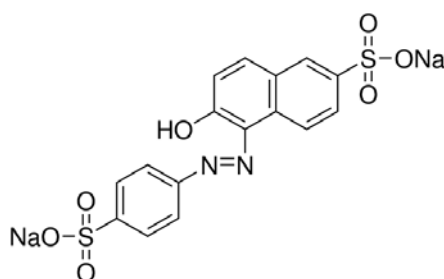
Figure 1. Chemical structure of Sunset Yellow FCF.

Adsorption equilibrium studies
Adsorption of Sunset Yellow on MCM-41 was studied by batch experiments. Equilibrium adsorption studies were conducted in a set of 50 mL capped volumetric flasks containing different amounts of adsorbent weights in the range of 0.1-0.3 g/L, 50 mL initial concentrations of sunset yellow solutions (10 mg/L). Flasks were shaken in a mechanical shaker (GFL 1086) at 100 rpm and different temperature (30, 40 and 50°C). After adsorption, samples were filtered and then the concentrations of sunset yellow in the supernatant solution was analyzed. All concentrations were measured by using UV spectrophotometer (LaboMed Inc.) at 482 nm. The adsorption efficiency E is calculated using Eq. (1):

$$E = \frac{(C_0 - C_e)}{C_0} 100 \tag{1}$$

where C_0 and C_e (mg/L) are the liquid-phase concentrations of dye at initial and equilibrium, respectively. The sunset yellow uptake at equilibrium, q_e (mg/g), was calculated using Eq. (2):

$$q_e = \frac{(C_0 - C_e)V}{W} \tag{2}$$

where V (L) is the volume of the solution, and W (g) is the mass of adsorbent used. The equilibrium data were simulated using the Freundlich and Langmuir isotherm models.

Adsorption kinetics

Kinetic adsorption experiments were carried out by adding 0.1 g/L adsorbent to 50 mL of 10 mg/L sunset yellow dye aqueous solutions at 30, 40 and 50°C at optimum pH. The uptake of sunset yellow at time t, q_t (mg/g) was calculated by the following equation:

$$q_t = \frac{(C_0 - C_t)V}{W} \tag{3}$$

where C_t (mg/L) is the liquid-phase concentration of dye at time t (min).

In order to predict adsorption behavior of sunset yellow FCF on MCM-41, pseudo-first-order and pseudo-second-order kinetics equations which are described as Eqs. (4) and (5), respectively, were applied for modeling experimental data

$$log(q_e - q_t) = log\, q_e - \frac{k_1 t}{2.303} \tag{4}$$

$$\frac{t}{q_t} = \frac{1}{k_2 q_e^2} + \frac{t}{q_e} \tag{5}$$

where k_1 (1/min) and k_2 (g/mg min) are the adsorption rate constants of the pseudo-first-order and pseudo-second-order, respectively.

Adsorption Thermodynamics
To describe thermodynamics behavior of the adsorption of sunset yellow dye onto MCM-41, thermodynamics parameters including the change in free energy ($\Delta G°$), enthalpy ($\Delta H°$) and entropy ($\Delta S°$) were calculated as per the following equations:

$$\Delta G° = -RT lnKc$$
$$lnK_C = -\frac{\Delta H°}{RT} + \frac{\Delta S°}{R}$$

where R is the universal gas constant (8.314 J/mol K), T is the temperature (K) and $K_C = C_{ads}/C_e$ is the equilibrium constant of the sunset yellow adsorption equilibrium (which is a ratio of C_{ads}, the sunset yellow concentration in the adsorbent, and C_e, the sunset yellow concentration in the adsorbate.

Results and Discussion

The surface physical properties of MCM-41 were characterized with an automated gas sorption apparatus using N_2 as adsorbate at 77.4 K (Micromeritics TriStar II 3020). Nitrogen adsorption is a standart technique widely used for the determination of porosity of adsorbent. Figure 2 shows the isotherm of the MCM-41. The pore structure of the MCM-41 was calculated by the t-method analysis from the adsorption branch of the nitrogen isotherms (Oguz Erdogan 2016; Erdogan and Oguz Erdogan 2016).
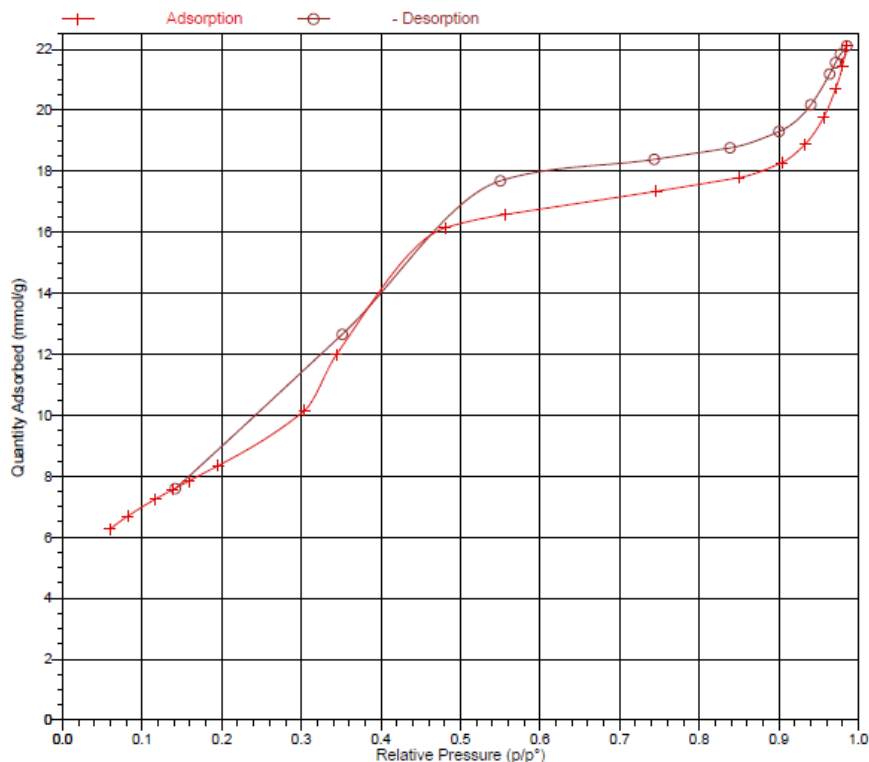
Figure 2. Adsorption-desorption isotherms of the MCM-41.

Table 1 shows the BET and Langmuir surface areas, total pore volume and avarage pore size for the MCM-41. The average pore size of the MCM-41 was 4.32 nm with micropores and mesopores.

Table 1: Textural parameters of the MCM-41.

Properties	MCM-41
Brunauer-Emmett-Teller Surface Area (m^2/g)	689.32
Langmuir Surface Area (m^2/g)	1780
Total Pore Volume (mL/g)	0.598
Average Pore Size (nm)	4.32

Figure 3 showed that the adsorption capacities at equilibrium (q_e) decreased with an increase in adsorbent dose from 0.1 to 0.3 g/L. This is explained as a consequence of partial aggregation, which occurs at high adsorbent amount resulting in decreased active sites. A similar phenomenon was reported by Huang et al., Rubin et al., and Nweke and Okpokwasili.
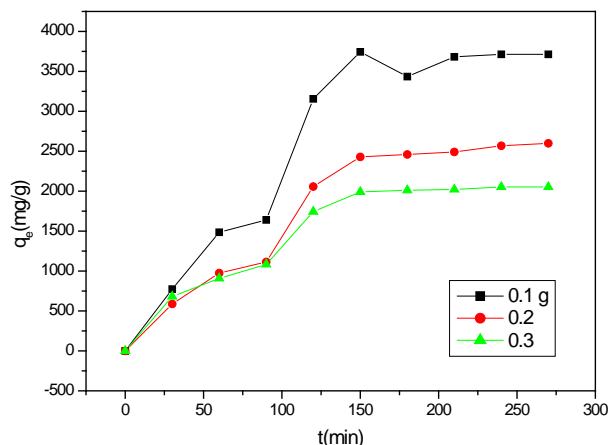
Figure 3. Effects of adsorbent dosage and contact time on the adsorptive uptake of food dye onto the MCM-41 (conditions: C_0=20 mg/L; temperature=40 °C).

The temperature dependence of sunset yellow sorption onto MCM-41 was studied at optimum adsorbent dosage of 0.3 g/L. Figure 4 shows that the food dye adsorption increased with temperature, which may be attributed to the enhanced reaction rate with higher temperature. A possible explanation is that high temperature extends the pore volume and surface area and provides more chances for sunset yellow dye to pass the external boundary layer and penetrate more easily. This corroborates the reports of our previous study (Erdogan and Oguz Erdogan 2016) . Similar behavior has been reported in the literature (Huang et al. 2015; Emami and Azizian 2014).
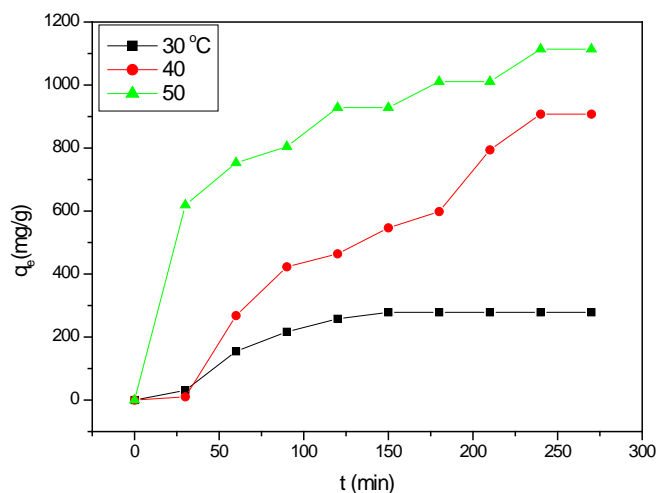
Figure 4. Effect of solution temperature on the adsorption food dye onto the MCM41 (conditions: W=0.03 g/L; C_0=10 mg/L).

Adsorption Isotherms
The equilibrium adsorption isotherms are essential to the practical design and optimization of adsorption process. The adsorption isotherm describes how adsorbates interact with adsorbents. The equilibrium data of food dye adsorption onto MCM-41 was explored using the isotherm model of Langmuir and Freundlich. The parameters obtained of the two isotherm models were calculated and represented in Table 2. The correlation coefficients descended in the order of: Langmuir> Freundlich. The results revealed that the adsorption of food dye on MCM-41 was best described by the Langmuir isotherm, indicating the adsorption was homogeneous and a monolayer was present.

Table 2: Freundlich and Langmuir isotherm constants for the adsorption sunset yellow onto MCM-41 at 40 °C

Isotherms	Parameters		
Freundlich	K_F (mg/g)(L/mg)$^{1/n}$	n	R^2
	3.74E-8	0.158	0.889
Langmuir	Q_0(mg/g)	K_L (L/mg)	R^2
	518.13	0.016	0.999

Langmuir adsorption isotherm constant related to adsorption capacity, Q_0 were found as 518.13 mg/g. To confirm the favorability of the adsorption, the separation factor R_L was calculated by

$$R_L = \frac{1}{1+K_L C_0}$$

where the adsorption process to be either unfavorable ($R_L > 1$), linear ($R_L = 1$), favorable ($0 < R_L < 1$) or irreversible ($R_L = 0$). Here, the value of R_L was found to be 0.502, which further confirmed that the Langmuir isotherm was favorable for of food dye on the MCM-41. Similar observation was reported for the adsorption of methylene blue dye onto the safflower seed derived activated carbons (Angın et al. 2014).

Conclusion

MCM-41 was used as the mesoporous adsorbent to remove food dye from aqueous solutions at various temperature. The adsorption capacity of MCM-41 for food dye increased while the temperature of solution was increased. The Freundlich and Langmuir isotherm models were used for the mathematical description of the adsorption of food dye onto MCM-41 at various temperatures and the results suggested that the adsorption equilibrium data fitted well to the Langmuir model. This study has revealed that MCM-41 can be used as a highly efficient adsorbent for sunset yellow food dye removal from aqueous solutions.

Acknowledgements

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ASSESSMENT OF FACTORS OF ENERGY CONSUMPTION IN RAILWAYS WITH THE AHP METHOD

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Abstract: Energy is one of the main issues that determine world politics. Energy efficiency has become compulsory in recent years. The energy consumed by transportation vehicles also has a great deal in world energy consumption. Therefore, today, we focus on energy saving and energy recovery in railway systems, which are frequently used in transportation. In this study, one of the multi-criteria decision making methods, AHP, was used to determine that which of the energy consumption factors in the railways is more important. For this purpose, some methods were chosen such as increased the power level, using of regenerative energy, using of energy storage systems, speed profile optimization and efficient driving methods. Also, energy consumption, emission reduction, travel time and system cost were chosen for AHP criteria. According to these criteria, the most important factor in energy reduction was obtained as the use of regenerative energy.

Keywords: Railway system, energy efficiency, regenerative energy, energy storage systems, AHP

Introduction

Today, rapid population growth, rapid urbanization rate and emission problem have increased the problems in energy sector. Transportation sector has a great share in total energy consumption and the energy which is used for transport constitutes approximately 33% of the total energy consumption and 86% use of fossil fuels. Therefore, railways systems are highly preferred because of high capacity and low energy consumption. Although, it is initially considered that the cost of these systems are more expensive than other transport systems, this cost is advantageous from others in terms of carrying capacity (Martinis V.D. & Gallo, 2013). Railway systems can be thought as modern and advanced tram and they are also reliable, economical, innovative and eco-friendly transport systems.

Rail systems are operated electrically and they rely on electrical supply from the national supply system in most countries. The most common ways of electrifying railways are by the 25 kV, 50 Hz AC single phase system or 750 VDC-1500 VDC system. Some railways use 15 kV AC single phase or 3000 VDC system but they are not common. In DC systems, the electric power is taken from the national grid as 33 kV or 11 kV voltage and the level voltage is reduced by the transformers along the way. Then, it is rectified and supplied to the conductor rails. In AC systems, the electric power is taken from the national grid as 132 kV or even higher and transmitted to transformer substation. This value is converted to the nominal value of 25 kV and this is given to line and transferred train by means of catenary system. This power is reduced to a lower voltage and is rectified by equipment on board the train (Bonnett, 2005).

Today, there are various energy efficiency and energy recovery studies in all energy consumption areas to ensure the sustainable energy. In the literature, several methods have been described to reduce energy consumption in railway systems. Gonzalez and the others, developed a method which includes energy optimization, effective driving methods and energy storage devices. The method provides about 25-35% gain the reduction in energy consumption (Gonzalez-Gil, Palacin, Batty, & Powell, 2014). Martinis and Gallo, tried to optimize the speed profiles of tracked vehicle systems and emphasized effective and efficient driving techniques (Martinis V.D. & Gallo, 2013). Açıkbaş and Söylemez, examined the effects of energy supply levels on energy consumption. For this purpose, they compared 750 VDC power system and 1500 VDC power system and observed that 1500 VDC power system gives approximately 10 % saving in traction of the system (Açıkbaş & Söylemez, 2004). Tian et all. pointed out that the best way to reduce the energy consumption is the effective use of regenerative energy for metro transit systems with frequently motoring and braking trains (Tian and others, 2017).

The methods which are used to reduce energy consumption in railway systems have various effects on system

cost, emission and travel time. For example, the use of energy storage devices results in a significant increase in system cost or efficient driving techniques lead to an increase in travel time. Therefore, five different methods were evaluated in terms of four different criteria. These methods were increased the power level, using of regenerative energy, using of energy storage systems, speed profile optimization and efficient driving methods. The criteria were energy consumption, emission reduction, travel time and system cost. In this evaluation, Analytic Hierarchy Process (AHP) was used. This is one of multi-criteria decision making methods and to reach goal briefly or to choose among alternative for achieving a specific purpose is easily through these methods.

The Electrification in Railway Systems

Railway systems are working with electricity and the basic components of electrification in rail systems are transformer centers, energy transmission lines and vehicles. The transformer central power demand depends on some factors such as train nominal power, frequency of train travel, the load, the number of rail etc. The voltage from the transformer substations is transmitted to vehicles by energy transmission system. Three different methods can be used as energy transmission line according to the level of DC voltage. These are catenary systems, 3rd rail systems and rigid catenary systems. Catenary system should be used for voltages above 1500 V and the vehicles are powered by the pantograph in this system. 3rd rail systems are generally used on subway lines and the vehicles are powered by equipment which is called as rail shoe. The rigid catenary system has been developed as an alternative to the others and can carry large currents. The energy that comes into the vehicles through energy transmission systems is consumed in proportion to the vehicle mass and speed of the vehicle according to Newton laws. Apart from these, the various comfort functions such as lighting, heating, cooling etc. in the system are another important part of the energy consumption. (Açıkbaş, 2008), (Sertsöz, 2012).

The railway system is the largest customer of electricity distribution companies according to energy consumption. In this respect, the energy optimization studies in railed systems will contribute to energy saving and positive environmental impact significantly (Baran, 2009). The Rail Energy project aims to reduce energy consumption by up to 6% in railway systems by 2020 in Europe (RailEnergy). According to the law which is published in 2008 by the Ministry of Transport in Turkey, it was emphasized to reduce electricity consumption in railway transportation to a minimum (Turkey Official Newspaper, 2008). There are some methods in the literature to reduce energy consumption in rail systems and five different methods were used in this article. These are described in below.

- **The increase of power supply level:** The energy losses occur in transformer center and transmission systems due to voltage drop. The first solution to reduce these losses is to increase of voltage level. In a study about this subject, 1500 VDC was preferred in the metro system that was opened in 2003 in Singapore (Gog, Chu, & Ng, 2004). In another study, a comparison of 750 VDC and 1500 VDC was made and when 1500 VDC was used, the voltage drop was reduced by half. While the distance between the transformers was 1.5 m when using 750 VDC, this value was 6 m when using 1500 VDC (Arlı, 2010).

- **The use of regenerative energy:** Since most of the transformer centers use one-way rectifier, they allow one way transmission. For this reason, the kinetic energy that is released during train braking, that is electrical energy, cannot be returned to the network. If this energy can be utilized in various forms, energy consumption can be significantly reduced. In a study, it was noted that energy losses during braking increase greatly due to red signal lamps (Lehmann & Hauser, 2002). In another study, several scenarios were been tested with the Belmann-Ford Algorithm including travel time and speed limits to increase the rate of use of regenerative energy in suburban trains and they found an increase of 17% (Lu, Weston, Hillmansen , Gooi, & Roberts, 2014).

- **The use of energy storage systems:** Nowadays, the energy that is released during braking can be stored with various systems such as batteries, ultra-capacitors and flywheel. These systems are used on the vehicle or along the line. Before using these systems, cost-efficiency studies are required. In an article which was done with ultra-capacitor, it was stated that the amount the load was increased. However, energy saving of between 23%-26% was been achieved according to type of ultra-capacitor and the number of passengers (Barrero, Mierlo, & Tackoen, 2008).

- **The speed profile optimization:** Some speed reductions provide energy saving but the time of travel should be within the limits according to speed. For example, over 10% during travel time can be equivalent to 25% energy saving (Dalyan, 2011).

- **The efficient driving methods:** The driving techniques have an important effect on energy consumption. The speed profile should be as follows: high initial acceleration, low coasting speed, long time with coasting,

high braking acceleration, low standby time. Energy consumption can be reduced by 12% with efficient driving methods compared to normal driving (Açıkbaş, 2008).

The Multicriteria Decision Making

Decision making is simply to achieve the goal or choose from alternatives for achieving a specific goal. Multi-criteria decision making is a sub branch of decision making. Today, different techniques are used in evaluation of alternatives according to the criteria. There are three steps to use any decision making technique including numerical analysis of alternatives. These can be expressed as:

-Determine the relevant criteria and alternatives,

-Attach numerical measures to the relative importance of the criteria and to impacts of the alternatives on these criteria,

- Process the numerical values to determine a ranking of each alternative (Triantaphyllou, 2000).

Today, different techniques are used in the evaluation of alternatives according to some criteria. Analytic hierarchy process (AHP), Analytic network process (ANP), Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), Elimination and Choice Translating Reality English (ELECTRE), The Preference Ranking Organization Method for Enrichment Evaluation (PROMETHEE), and Vise Kriterijumska Optimizacija I Kompromisno Resenje (VIKOR) are of some of these techniques. In this paper, AHP method was used for evaluation five different alternatives (increase of power supply level, the use of regenerative energy, the use of energy storage systems, the speed profile optimization and efficient driving methods) according to four different criteria (reduction of energy consumption, reduction of amount of emission, travel time and system cost). The numerical analysis of AHP is described below.

Analytical Hierarchy Process

This method was developed by Saaty in decision problems. The steps of the method are given below (Saaty, 1990).

Step 1: Definition of Decision Making Problem

The decision points and the factors must be determined to define the problem. The number of decision points is symbolized by m, and the number of factors affecting decision points is symbolized by n.

Step 2: Creating Factor-to-Factor Comparison Matrix

The comparison matrix of the factors is a dimensional square matrix. The components of this matrix on the diagonal take the value 1. The comparison matrix is shown in Equation 1.

$$A = \begin{bmatrix} a_{11} & a_{12} & a_{13} & \cdots & a_{1n} \\ a_{21} & a_{22} & a_{23} & \cdots & a_{2n} \\ a_{31} & a_{32} & a_{33} & \cdots & a_{3n} \\ \vdots & \vdots & \vdots & \vdots & \vdots \\ a_{m1} & a_{m2} & a_{m3} & \cdots & a_{m4} \end{bmatrix} \tag{1}$$

The comparison of the factors is done in one to one and reciprocal manner according to their importance values. The importance scale in Table 1 is used in the comparison of the factors.

Table 1. Importance scale used in AHP

Intensity of importance	Definition	Explanation
1	Equal importance	Two factors contribute equally to the objective.
3	More important	Experience and judgement slightly favour one over the other.
5	Much more important	Experience and judgement strongly favour one over the other.
7	Very much more important	Experience and judgement very strongly favour one over the other.
9	Absolutely more important	The evidence favouring one over the other is of the highest possible validity.
2,4,6,8	Intermediate values	When compromise is needed.

Step 3: Determine of the Factor's Percentage Distribution

The comparison matrix shows the significance levels of the factors according to each other within a certain semantic. The column vectors of the comparison matrix are used in order to determine the weights of these factors in all or the percentage distribution of factors. A and B column vector is formed with n-component and the components of the column vector B are calculated as shown in Equation 2. According to Equation 2, B column vector is shown in Equation 3.

$$b_{mn} = \frac{a_{mn}}{\sum_{m=1}^{k} a_{mn}} \tag{2}$$

$$B_i = \begin{bmatrix} b_{11} \\ b_{21} \\ \vdots \\ b_{n1} \end{bmatrix} \tag{3}$$

When B columns vectors are combined in a matrix format, the matrix-C is formed and this is shown in Equation 4.

$$C = \begin{bmatrix} c_{11} & c_{12} & \dots & c_{1n} \\ c_{21} & c_{22} & \dots & c_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ c_{n1} & c_{n2} & \dots & c_{nn} \end{bmatrix} \tag{4}$$

The percentage significance distributions that show the important values with respect to each other can be obtained with using C matrix. As shown in Equation 5, the weighting vector-W is formed by taking the arithmetic mean of the row components of C matrix.

$$w_m = \frac{\sum_{n=1}^{k} c_{mn}}{k} \tag{5}$$

$$W = \begin{bmatrix} w_1 \\ w_2 \\ \vdots \\ w_n \end{bmatrix} \tag{6}$$

Step 4: Determine of Consistency of Factor Comparison
In this step, consistency of factor comparison is measured. The consistency rate (CR) indicates whether comparisons made are true or false. D, column factor is found by multiplying comparison matrix A with weighting vector W. The evaluation factor (Ei) is obtained by dividing column vector D to the corresponding elements of column vector W as shown in Equation 8. The evaluation factor related to the comparison (λ) is obtained by taking the mean of Ei elements as shown in Equation 9. Then, consistency index (CI) and the consistency rate (CR) are calculated as shown in Equations (10) and (11)

$$D = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \vdots & \vdots & \dots & \vdots \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{bmatrix} x \begin{bmatrix} w_1 \\ w_2 \\ \vdots \\ w_n \end{bmatrix} \tag{7}$$

$$E_i = \frac{D_i}{W_i} \quad i = 1,2,..n \tag{8}$$

$$\lambda = \frac{\sum_{i=1}^{n} E_i}{n} \tag{9}$$

$$CI = \frac{\lambda - n}{n - 1} \tag{10}$$

$$CR = \frac{CI}{RI} \tag{11}$$

where RI is called random indicator and it has different values according to the number of criteria (n). The values of RI according to n, is given in Table 2. If the consistency rate (CR) is smaller than 0.10, comparison matrix is consistent [20].

Table 2. The values of RI

k	RI	k	RI
1	0	6	1.24
2	0	7	1.32
3	0.58	8	1.41
4	0.90	9	1.45
5	1.12	10	1.49

Step 5: Found The Percentage Distribution of the Decision Point for Each Factor

In this step, the percent significance distributions of the decision points are determined for each factor. Individual comparisons and matrix operations are repeated as many times as the number of factors (n times). The size of the comparison matrix that will be used as the decision points of each factor will be mxm. After each comparison operation, column vectors S that show percentage distribution and have a size of mx1 are obtained. It is given in Equation 12.

$$S_m = \begin{bmatrix} s_{11} \\ s_{21} \\ \vdots \\ s_{m1} \end{bmatrix} \tag{12}$$

Then, an mxm dimensional K decision matrix which is consisted from n dimension column vector, S is formed. It is given in Equation 13.

$$K = \begin{bmatrix} s_{11} & s_{12} & \dots & s_{1n} \\ s_{21} & s_{22} & \dots & s_{2n} \\ \vdots & \vdots & \dots & \vdots \\ s_{m1} & s_{m2} & \dots & s_{mn} \end{bmatrix} \tag{13}$$

Finally, when the decision matrix and weighting factor are multiplied, the column vector, L-column vector is obtained. L vector gives the percentage distribution of decision points.

$$L = \begin{bmatrix} s_{11} & s_{12} & \dots & s_{1n} \\ s_{21} & s_{22} & \dots & s_{2n} \\ \vdots & \vdots & \dots & \vdots \\ s_{m1} & s_{m2} & \dots & s_{mn} \end{bmatrix} x \begin{bmatrix} w_1 \\ w_2 \\ \vdots \\ w_n \end{bmatrix} = \begin{bmatrix} l_{11} \\ l_{21} \\ \vdots \\ l_{m1} \end{bmatrix} \tag{14}$$

Results

In this paper, Analytic Hierarchy Process (AHP) method was used for evaluation of the methods used to reduce energy consumption in railway system. Various papers in the literature was been utilized to determine the methods and the criteria. The five different methods which used in the paper can be listed as follows: increase of power supply level, the use of regenerative energy, the use of energy storage systems, the speed profile optimization and efficient driving methods. The four criteria which used in the paper can be listed as follows: reduction of energy consumption, reduction of amount of emission, travel time and system cost. The solution steps of AHP were carried out one by one.

Firstly, the comparison matrix, A for the 4 criteria was formed as Table 3. EC is symbolized for reduction of energy consumption, LE is symbolized for low emission, TT is symbolized for travel time and SC is symbolized for system cost. While the values in Table 3 were being prepared, Table 1 was taken as reference. In the paper, the reduction in energy consumption was chosen as the most important criterion in the study. Then, the order of importance was determined as low cost, low emission and travel time respectively.

Table 3. Comparison matrix for four criteria.

	EC	LE	TT	SC
EC	1	5	7	3
LE	0,2	1	3	0,333
TT	0,143	0,333	1	0,2
SC	0,333	3	5	1

Then, weighting vector, W was found using B and C matrix. These operations were carried out with using Equations 2-5. The consistency rate (CI) was found using the Equations 7-11 to find the consistency of the criterion comparison matrix. According to Table 2, the random indicator (RI) was taken as 0.90 due to four criteria in calculations. A CR value must be less than 0.10 for consistent matrix. We found this value to be 0.0555, so the comparison matrix is consistency. These values are shown in Table 4.

Table 4. Weighting vector of criteria, the results of consistency

Wec	0.557	λ	4.149
Wle	0.122	**CI**	0.050
Wtt	0.056	**RI**	0.90
Wsc	0.263	**CR**	0.055

Later, the values of alternatives were created according to criteria. The order of the alternatives in terms of energy consumption is determined as follows.

Regenerative Energy (RE)> Energy Storage Systems (ESS)> Increase of Power Supply Level (PSL)> Efficient Driving (ED)>Speed Profile Optimization (SPO)

The order of the alternatives in terms of low emission is determined as follows.

Regenerative Energy (RE)> Energy Storage Systems (ESS)> Speed Profile Optimization (SPO)>Increase of Power Supply Level (PSL)> Efficient Driving (ED)

The order of the alternatives in terms of travel time is determined as follows.

Increase of Power Supply Level (PSL)> Energy Storage Systems (ESS)> Regenerative Energy (RE)> Efficient Driving (ED)≥ Speed Profile Optimization (SPO)

The order of the alternatives in terms of low system cost is determined as follows.

Speed Profile Optimization (SPO)> Efficient Driving (ED)> Regenerative Energy (RE)> Energy Storage Systems (ESS)> Increase of Power Supply Level (PSL)

Table 5.a, 5.b, 5.c, 5.d were formed according to Table 1 and these sequences. The values of alternatives are shown in Table 5.a according to energy consumption. The values of alternatives are shown in Table 5.b according to low emission. The values of alternatives are shown in Table 5.c according to travel time. The values of alternatives are shown in Table 5.d according to system cost. The consistency rate was found for all matrices which have shown in Table 5.a, 5.b, 5.c, 5.d. These values are 0.0541, 0.0608, 0.0468, and 0.0711. Therefore, all matrices are consistent.

Table 5.a. The value of alternatives according to energy consumption

Energy Consumption	PSL	RE	ESS	SPO	ED
PSL	1	0,2	0,333	5	3
RE	5	1	3	9	7
ESS	3	0,333	1	7	5
SPO	0,2	0,111	0,143	1	0,333
ED	0,33	0,143	0,2	3	1

Table 5.b. The value of alternatives according to low emission

Low emission	PSL	RE	ESS	SPO	ED
PSL	1	0,143	0,2	0,333	3
RE	7	1	3	5	9
ESS	5	0,333	1	3	7
SPO	3	0,2	0,333	1	5
ED	0,333	0,111	0,143	0,2	1

Table 5.c. The value of alternatives according to travel time

Travel time	PSL	RE	ESS	SPO	ED
PSL	1	5	3	8	7
RE	0,2	1	0,333	4	3
ESS	0,333	3	1	6	5
SPO	0,125	0,25	0,166	1	0,5
ED	0,143	0,333	0,2	2	1

Table 5.d. The value of alternatives according to system cost

System Cost	PSL	RE	ESS	HPO	ED
PSL	1	0,2	0,333	0,111	0,143
RE	5	1	3	0,2	0,333
ESS	3	0,333	1	0,143	0,2
SPO	9	5	7	1	3
ED	7	3	5	0,333	1

Finally, according to AHP method, the selection matrix of alternatives was found as in Table 6.

Table 6. Evaluation of alternatives

PSL	0,112
RE	0,385
ESS	0,209
SPO	0,170
ED	0,114

Conclusions

The energy efficiency has become more important because of the constant increase in energy demand. Various methods have also been developed for railway system which are the most important energy consumption units. In this paper, the methods were evaluated for different criteria. The AHP method was used in this evaluation process. Because we can evaluate alternatives in terms of criteria with this method. Five different methods for reducing energy in railways were selected as increase of power supply level, the use of regenerative energy, the use of energy storage systems, the speed profile optimization and efficient driving methods. Also, for the AHP, four different criteria were selected as reduction of energy consumption, reduction of amount of emission, travel time and system cost. As a result of the study, it can be seen that the use of regenerative energy is the most effecting factor in energy consumption with 38%. The other factors are the use of energy storage systems with 21%, speed profile optimization with 17%, efficient driving methods with 11.4%, increase of power supply level with 11.2%.

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CARDIAC ARRYTHMIA CLASSIFICATION BY NEURONAL NETWORKS (MLP)

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Abstract: Cardiac activity is one of the most important determinants of a patient's condition. It results in the appearance of several waves on the course of the electrocardiograph: it is the cardiac signal, the electrocardiogram: ECG. The analysis of the ECG signal and the identification of its parameters constitute an essential step for the diagnosis. However, a set of methods and algorithms are developed in view of the importance of this signal and its use in clinical routine in the diagnosis of cardiac pathological cases. This paper fits into this problem and proposes a classifier of cardiac arrhythmias by application of neural networks. The results were validated by ECG signals from the different patients in the MIT-BIH Arrhythmias database, and given a recognition rate of 94%, this rate of classification exceeds the results obtained in the literature.

Keywords: Neuronal Network , Classification, MIT-BIH data base, Electrocardiogram (ECG).

Introduction

Over the past decade, automatic preventive recognition of markers for cardiac arrhythmia in which numerous studies have been proposed. Which will, for the most part, exploit artificial intelligence and data mining approaches to automatically analyze ECG signals, which are difficult to perform manually. These systems improve signal quality (noise filtering), extract information that is not visible through direct visual analysis and provide a diagnosis that can provide sufficient support to doctors to make the right decisions. However, automating the detection of cardiovascular disease from the ECG signal is not trivial and gives the doctor a good diagnosis. In addition, the provision of a system with sufficient expertise to automate diagnosis is an extremely tedious task.

The presented work in this paper proposes classification of PVC beats, and is organized as follows:
In the first section, we introduced the problematic and then examined related works to classify cardiac arrhythmia in Section 2. The third section presents details works specialized in detection of the PVC pathology. The proposed approach is detailed in Section 4.
Our experimental results and a discussion are presented in Section 5. Finally, the conclusion is drawn and future work is suggested in the last section.

Related Works

In the literature, we find several techniques applying various methods, the goal of which is to simplify the reading of an ECG signal; we have been interested in the following works:
The ARTMAP (Adaptive Resonance Theory Mapping) theory was used in (Ham, 1996) to test two types of heartbeat (normal beat and beat of premature ventricular contraction). It gave a classification rate of 97%. In (Al-Nashash, 2000) ,using only 14 records from the MIT-BIH database, the neural network-based classifier presented by Nashash reached a sensitivity of 98.1% and a positive predictive of 94.7%. A neural classifier of the PVC (Premature Ventricular Contraction) combined with the wavelet transformation and the temporal characteristic of the ECG was proposed by Inan. It obtained an accuracy of 85.20% on 40 records (Inan, 2006). Quiniou et al (Quiniou, 2006) proposed inductive logic programming, which is an automatic learning technique for chronicle recognition. Their system called CRS (Chronicle Recognition System), developed at France Telecom R & D Lannion, allows efficient processing of important event flows and chronic bases of consequent size.

Artificial Neuro Networks (ANN)

A neural network is a computational model whose design is very schematically inspired by the functioning of real neurons. Neural networks are generally optimized by statistical learning methods, so that they are placed on

the one hand in the family of statistical applications, which they enrich with a set of paradigms allowing to generate large spaces functional, flexible and partially structured, and on the other hand in the family of methods of artificial intelligence which they enrich by making decisions based more on perception than on logical reasoning forms (Haykin, 1999).

Structure Of Artificial Neuro Networks (ANN)

There are three possible types of neurons, which are organized into disjoint subsets called layers (input layer, hidden layer, and output layer). A neuron is connected to another neuron with a connection, which functions as a unidirectional instant signal. Each connection between these neurons is associated with a quantity called the weight or binding force (Haykin, 1999) [Figure 1].
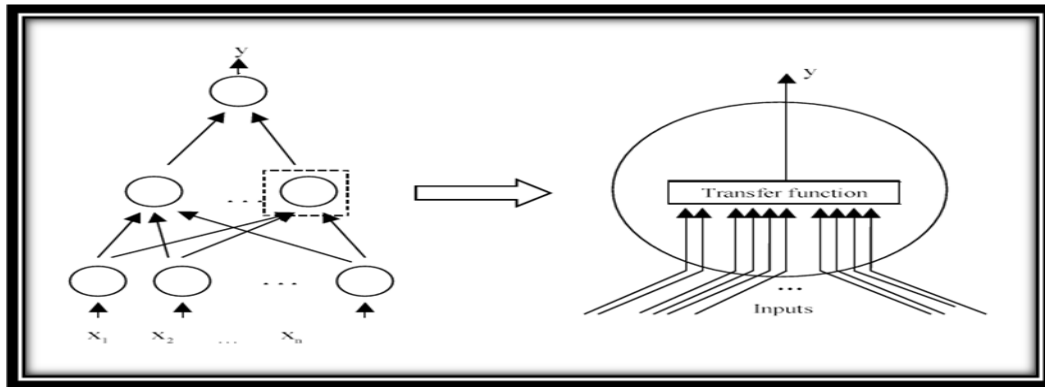
Figure 1: A network of neurons and its basic processing element.

First, the neuron computes an input network value by summing the input values multiplied by their corresponding weights. Then, the neuron determines the output value by applying a transfer function, which is generally a threshold function as a sigmoid. In addition, updates the weights of the neurons according to the procedure gained.

Input neurons behave differently from other neurons. Each of the input neurons receives exactly one input signal, which represents an element of an input configuration outside the network. Therefore, the neurons of the input layer thus have an input pattern for all output neurons. As a general rule, these neurons do not distribute signals to the neurons in the next layer (Haykin, 1999).

ECG Signal

In [Figure 2], we have the different waves of a normal ECG, in our study we are interested in the Ventricular case that can cause sudden death in a patient.
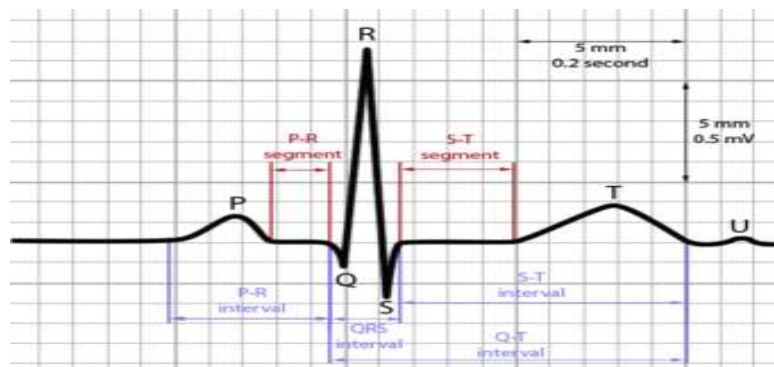
Figure 2: The different wave Electrocardiogram (ECG) signal.

Premature Ventricular Contraction (PVC)

Ventricular fibrillation is a cardiac rhythm disorder which manifests as a complete disorganization of the electrical activity of the ventricles with the immediate consequence of the loss of any effective cardiac contraction. According to (Briand, 2002) Ventricular fibrillation is characterized by the occurrence of very abnormal, widely varying, abnormally large, unequally amplitude ventricular complexes, occurring in a totally

irregular and high frequency manner (Talbi, 2011).

The parameters used to try to predict the risk of PVC are relative to the QRS and P waves of the ECG [Figure 3].
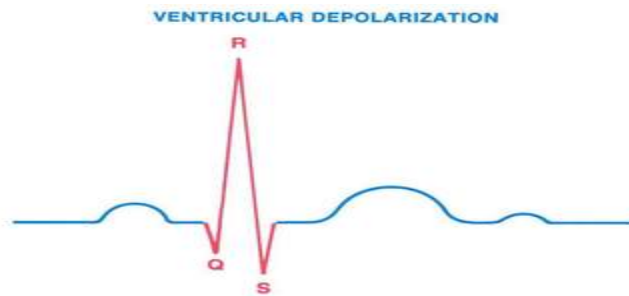
Figure 3: ECG of a subject which has premature ventricular contractions (PVC) (Talbi, 2011).

To discriminate between the two types of beats (normal and at risk (PVC)), it is imperative to calculate certain parameters and characteristics that can constitute the input vectors of the classifier. These feature vectors are each composed of 9 elements:

- The temporal parameters, namely the duration and the amplitude of the P wave represent the two first elements of the vector and the duration of the QRS complex.
- The shape of the QRS complex.

Experimentation

The ECG signals used in this work are the actual recordings of the database MIT-BIH. These signals are sampled at the frequency of 360 Hz. two American cardiologists have made annotations on these signals and who made the diagnosis for these recordings, and each cardiac cycle has been annotated by them. These parameters are essential for learning and classification evaluation.

The parameters used were calculated using an algorithm developed and implemented in the LTSI laboratory at the University of Rennes 1 France. This algorithm is based on the technique presented by J. Pan WJ Tompkins and (Pan et al, 1985) was applied to the MIT-BIH data base (MIT BIH, 1992).

The right choice of the parameters of the input vector classifier is very important. For this three-dimensional geometric data analysis is recommended to see the degree of membership of each parameter for each class (Normal, Ventricular, Other).

Parameters	Signification
1	*The moment of detection of the peak R*
2	*QRS onset*
3	*QRS offset*
4	*Last RR interval*
5	*Beat begin*
6	*Beat end*
7	*Iso electric level*
8	*Amplitude pic to pic*
9	*ST level*

Table 1: Parameters of MIT-BIH data base.

Methodologies

The multilayer perceptron (PMC) is the most widely used network. It is a feedforward network composed of successive layers. Each neuron of a layer receives signals from the previous layer and transmits the result to the next one, if it exists. Neurons of the same layer are not interconnected. A neuron can not therefore send its result that has a neuron located in a layer posterior to his. The orientation of the network is fixed by the single direction of propagation of information, of the input layer to the output layer. For the networks considered, the notions of input and output layers are therefore systematic. The latter constitute the interface of the network with the outside. The input layer receives the input (or variable) signals and the output layer provides the results. Finally, the neurons of the other layers (layers hidden) have no connection with the outside and are called hidden neurons.By convention, the input neurons always have an activation function (identity), letting the information pass without modifying it. As regards the output neuron, it may be associated with a linear or non-derivative activation function, which may or may not be derivable, depending on the nature of the problem to be solved. This type of network is very efficient for classification problems (Parizeau, 2004).

Architecture

The network designed for the classification of heart beats is Multi-Layer Perceptron (MLP) [Figure 4].
 - The input vector X=[x1 x2 … x9] represents 9 parameters characterizing a heartbeat of the data base LTSI [Table 1], which have been linked to all neurons in MLP network, and gives a single output unit, which produces the variable Y.

- The external connections of the neuron i with the input vector S is materialized by a synaptic weight vector Mi = [mi1 mi2 …mi9] whose weights are assigned randomly to the top.

- Each neuron i of the map is related to all other neurons map: interaction between neurons. wik the internal connections of the neuron i with its neighbors are performed by assigning synaptic weights.

- This model realizes an application of Rp in R.
- The network architecture determined by the neuron connection scheme is a composition of elementary function and represents a family G (.W) of nonlinear functions and whose parameters are the weights of connections of the network W.
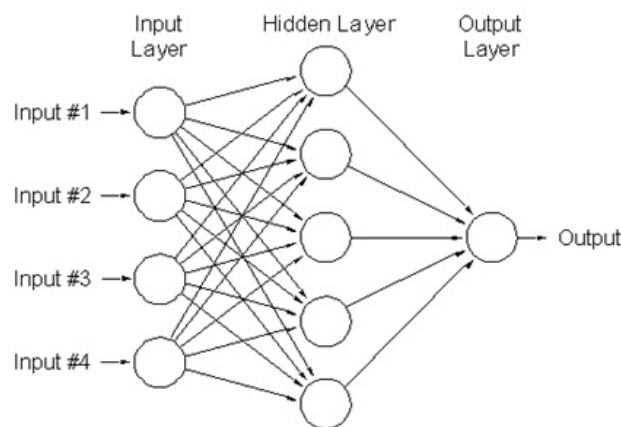
Figure 4: Multi-Layer Perceptron (MLP).

- The output of the network will have an expression of the following form depending on the number of layers which compose it :

$$Y = \sum_{i=1}^{n} W_i - f_i (\sum_{j=1}^{p} W_{ij} . X_j + X_{i0}) + W_0 \qquad (1)$$

- Estimating the weights of the MLP network involves least-squares minimization of the error (a cost function) defined on the learning basis. This error is given by:

$$E(\vec{W}) = \frac{1}{2} \times \sum_{examples} (cible - output)^2 \qquad (2)$$

Learning Network

A learning system takes as input a set of examples (cardiac cycles) from which it seeks a definition. In our case, the system seeks to learn the forms of cardiac arrhythmias from the examples provided at its entry from the MIT-BIH database.

These examples are presented in the form of parameters (elements of the input vector [Table 1]) which represent the temporal and morphological characteristics of the cardiac cycles classified according to the arrhythmias to which they correspond.

The learning algorithm-back propagation in this case-ensures that the classes produced allow to best discriminate the input examples.

Implementation Of The Classifier

The purpose of the software implementation of the classifier is to determine the size and parameters of the neural network, namely:
- Number of layers and number of neurons for each layer.
- Error reached.
- Number of iterations.

These settings provide the best network performance. We discuss in this section the conditions and method of learning, the database used the programming and the dimensioning of the network.

Experiment Results

The database used allowed the creation of two other databases: one for learning and the other for testing, which will be used for the training and evaluation of our classifier. The selected patients are given in the following table [Table 3].

Once the learning has been completed, it is necessary to test on another database different from that of the learning.

For the evaluation of our classification system, we used four statistical laws based on the recognition of mutual categories: Tp (True positive), Tn (True negative), Fp (False positive), Fn (False negative).

These laws are as follows:

The sensibility : $Se = Tp / (Tp + Fn)$, it is the fraction of real cases targeted correctly recognized on all the actual cases referred to.

The specificity: $Sp = Tn / (Tn + Fp)$, this is the fraction of actual non-target cases properly rejected.

The correct classification : $CC = (Tp + Tn) / (Tp + Tn + Fp + Fn)$, this is the correct classification rate.

The results presented in this study for the classification of ECG signals were obtained by applying to the classifier input ECG signals of "MIT BIH Arrhythmia Database". The sensitivity, specificity and classification rate are three parameters calculated for each signal to evaluate and compare the results obtained. The performance of the classifier is shown in [Table 3].

Our classification system allowed us to obtain a recognition rate of 94% by applying the set of ECG signals of MIT BIH Database with a specificity of 96.49% and a sensitivity of 94.60%. These performances were achieved mainly through:

Signals	Normal Beat	PVC Beat	SE	SP	CC
Patient 1	2272	2239	99	95.08	95.03
Patient 2	1864	1860	NAN	93.01	93.5
Patient 3	2186	99	100	100	100
Patient 4	2026	1506	97.01	97.05	97.01
Patient 5	2650	2423	86.03	84	84.02
Patient 6	2256	225	99.01	83.05	83.06
Patient 7	2601	1743	81.04	96.07	94.03

Table 3: Percentage recognition rate of the classifier.

Conclusion and Perspectives

In this article, we propose a system for the diagnosis of very common cardiac arrhythmias (PVC), based on neural networks MLP, which is responsible for determining the type of heartbeat according to its most representative characteristics. The learning algorithm was implemented under the Matlab environment. Tests carried out on a MIT-BIH database made it possible to achieve a classification rate close to 94%. The result is satisfactory as long as we have improved the performance of the classifier on the one hand and, on the other hand, a network that has a minimal architecture with respect to the number of classes in output. This point is very important because it allows minimizing the response time of the classifier if one wants to have a Reel time classifier.

Among the prospects of this work, the expansion of the database, and tried other methods of classification.

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COLD METAL TRANSFER (CMT) WELDING TECHNOLOGY

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Abstract: The cold metal transfer (CMT) process basically uses the same system as a Metal Inert Gas/Metal Active Gas   (MIG/MAG) system. The CMT process concentrates on welding of thin sheet metal products from stainless steel, aluminum (Al), magnesium (Mg), Mg-Al alloys and dissimilar metals etc. The CMT technology is an alternative to MIG/MAG, providing advantages, such as reduction of distortions, high welding speed, good tensile performance and increased productivity. This is mainly due to low heat input, achieved by controlled movement of the electrode. CMT provides the most stable arc and a complete process regulation. Thus, it gives better results. In this study, the technology of cold metal transfer welding was investigated.

Keywords: Welding, CMT, Process, Metal Joint

Introduction

Fusion welding is an ideal and economical means of achieving good productivity. Fusion welding through MIG/MAG is achieved by coalescence of metals by melting continuously feed current-carrying wire. Its wide popularity is due to practical advantages offered like: continuously feed electrode, flux free operation, relatively low operator skills required, ease of automation. But, it is very important to reduce the negative effects of local melting at fusion welding of metals.

There are materials and applications that cannot withstand the constant heat of a welding process. During welding, temperature variations in welds and parent metals have important effects on material characteristics, residual stresses as well as on dimensional and shape accuracy of welded products. This is especially important in the case of thin sheet metal products, where control over welding distortions or deformations is difficult. The joining of dissimilar materials requires precise knowledge of the properties of each material. Aluminum is highly regarded due to its low specific weight and its excellent usability and processing characteristics. On the other hand, its strength and low cost make steel indispensable in many areas of industry. Other requirements primarily address anti-corrosion features, thermal expansion coefficient, and atomic properties. When joining steel and aluminum under the influence of heat, what is known as an intermetallic phase is created at the interface between the two materials. The more heat that is applied, the more extensive the intermetallic phase and the poorer the mechanical properties of the join will be.

The CMT process evolved from the continuous adaptation of the MIG/MAG process to resolve the problems posed by the joining of metals. CMT is a controlled process and allows the material transfer to take place with barely any flow of current (Talalaeva et al, 2012; Website1, 2017; Pickin et al, 2015; Pickin et al, 2011).

Cold Metal Transfer (CMT) Method

The CMT (Cold Metal Transfer) process is a revolution in welding technology both in welding equipment and applications (Website2. 2017). Cold metal transfer (CMT) is an automated welding process based on dip transfer welding, characterized by controlled material deposition during the short circuit of the wire electrode to the workpiece (Pickin and Young, 2013). CMT welding is a variant of MIG/MAG welding. This process has been developed for applications where a controlled low level of heat transfer is desired (Website3, 2017).

CMT is known as an innovated welding process based on short-circuiting transfer process with low heat input and no spatter. It is suitable to join the very thin sheets which are widely used in the machine parts (Lin et al, 2013). The principal innovation is that the motions of the wire have been integrated into the welding process and into the

overall control of the process. Every time the short circuit occurs, the digital process-control both interrupts the power supply and controls the retraction of the wire. The wire retraction motion assists droplet detachment during the short circuit, thus the metal can transfer into the welding pool without the aid of the electromagnetic force. Then the heat input and spatter can be decreased greatly (Feng et al, 2009). During the joining process, the low heat input is the key important factor, and it is directly related to the joining zone. Therefore, in order to obtain a joint with excellent performance, a lower heat input is preferred. In this situation, cold metal transfer (CMT) arc welding as a modified metal inert gas welding process is characterized by low heat input and no-spatter welding, which is very suitable for joining of metals (Zhou et al, 2014). The CMT welding equipment is shown in Figure 1.
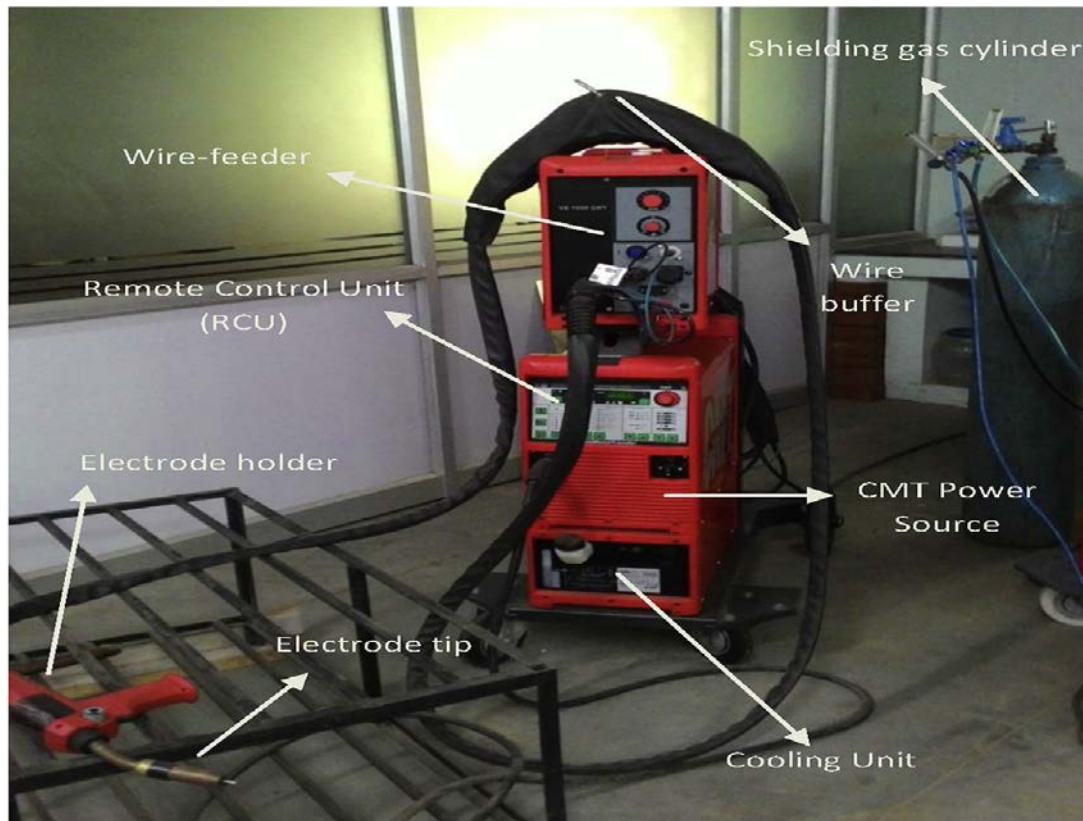
Figure 1. CMT welding equipment (Kumar et al, 2016).

A typical CMT welding electrical signal cycle is shown in Figure 2. A cycle can be defined as the period required to deposit a droplet of molten electrode into the weld pool. From the figure, we can divide the cycle into three phases: (1) the peak current phase. This is represented by a constant arc voltage corresponding to a high pulse of current. The high pulse current make the ignition of the welding arc easily and then heats the wire electrode to form droplet. In this phase, the brightness of the arc is very high. (2) The background current phase. The phase is represented by a lower current. Through the peak current phase, a little liquid droplet is formed on the wire tip. In order to inhibit the globular transfer, so the current decreases abruptly. This phase is the background current phase. Then the low current keeps constant until the short-circuiting process happens. (3) The short-circuiting phase. In this phase, the wire contacts with the weld pool and the arc voltage changes into zero and the arc extinguishes. The back-drawing force becomes the main factor to urge the droplet break away from the wire into the weld pool (Zhang et al, 2009).
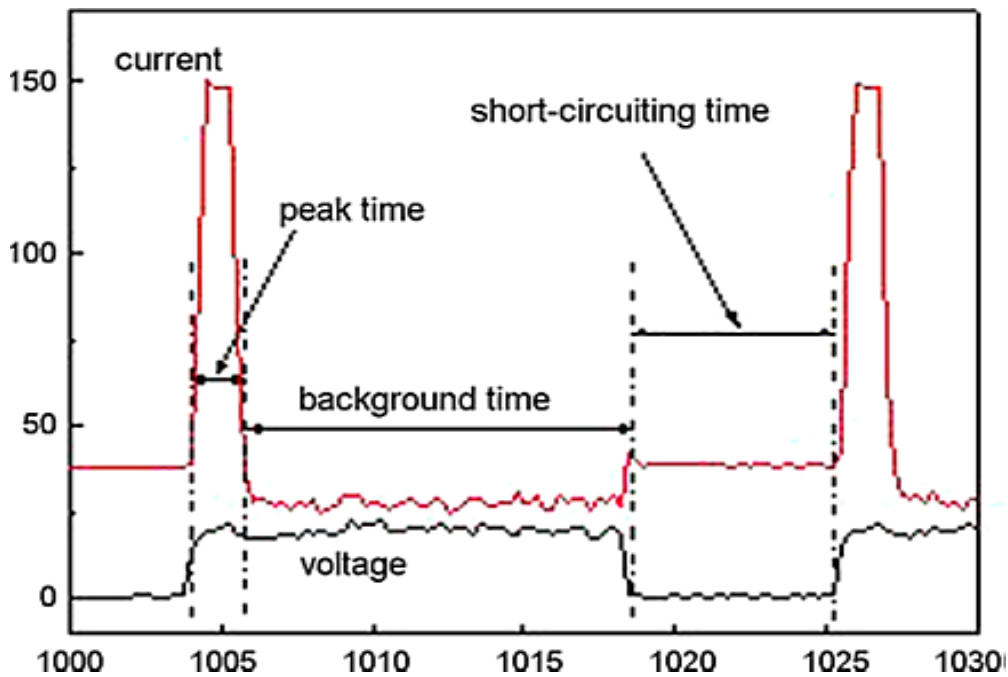
Figure 2. The current and voltage waveforms of the CMT process (Zhang et al, 2009).

The only major difference between most of the systems relates to whether they are regulated by software or hardware. The exception is the CMT system, which integrates control of the motion of the wire into the welding process control to support droplet formation and detachment. This principal phases of wire motion control is shown in Figure 3 (A,B,C,D). During the arcing period, the wire motion towards the weld-pool (A), When the wire dips into the weld-pool, short circuiting occurs, the arc is extinguished and the welding current is lowered (B), at which point the wire is retracted, the rearward movement of the wire assists droplet detachment during the short circuit (C). Metal transfer supported by surface tension in the melt means that the current can be maintained at a very low level; with reduced heat input and spatter. After opening of the short circuit, the wire motion is reversed and the process begins all over again (D). In this case, the process cycle is random, with the oscillation frequency varying with time; but typically around 70 Hz. Up to 70 shifts of cold and hot phases are made every second and this decreases the thermal influence on the workpiece (Website4. 2017).
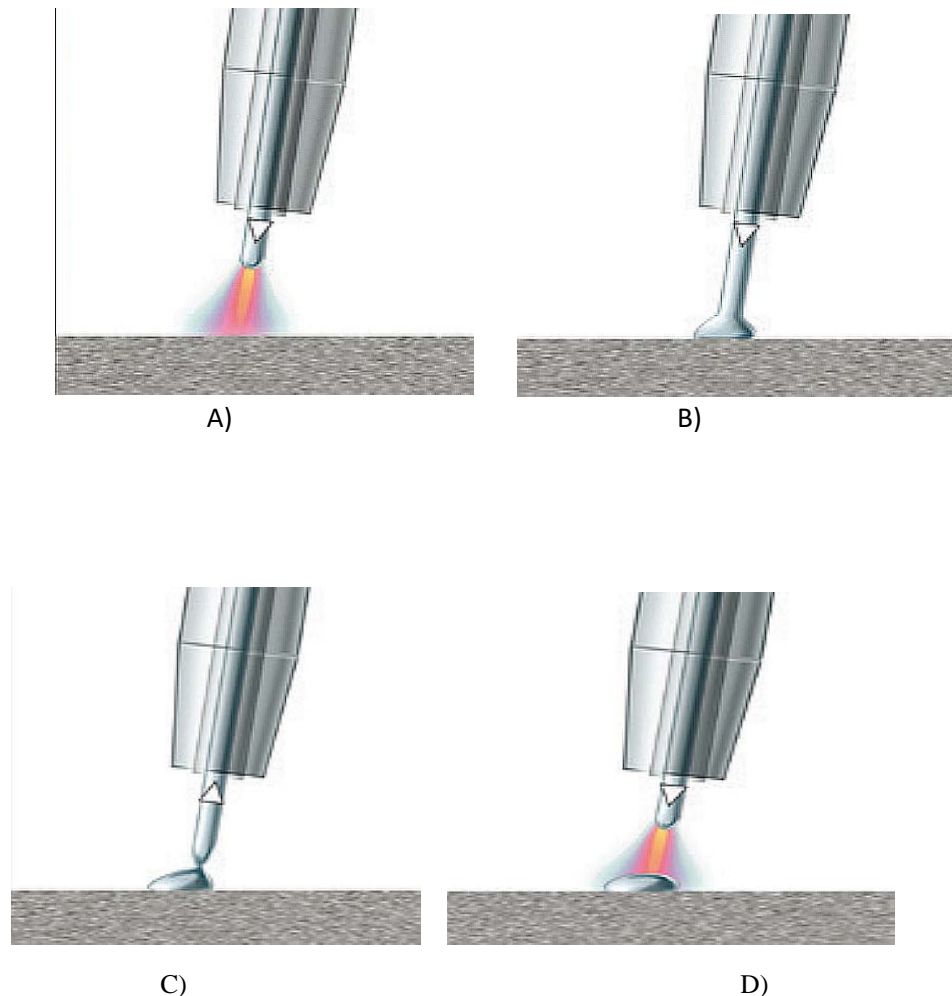
Figure 3 (A,B,C,D). Principal phases of wire feed control in the CMT process (Website4. 2017).

Conclusions

The CMT process has a universal range of application and sets brand-new standards in welding technology. CMT has a number of more than satisfactory mechanical and technological characteristics. The CMT Process is suitable for use in all industrial sectors: from the automotive and supplier industries to industrial plant and pipeline construction, to maintenance and repair work. Essentially, all automated or robot-assisted tasks are suitable. All customary base and filler metals can be used. There are a number of other extremely interesting potential applications, including the spatter-free brazing of coated sheets, the light-gauge welding of aluminum, welding of magnesium, dissimilar metal joining and controlling of the intermetallic compound layer thickness. A large number of trials are currently in progress. CMT process is likely to be suitable for many applications in the future.

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CONVERSION PROCESS OF VISUAL-RELATED PRAISES OF WOMEN DURING YEŞİLÇAM PERIOD OF TURKISH CINEMA TO VISUAL CODES OF CULTURE AS EMBODIED BY TÜRKAN ŞORAY

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Abstract: Human is a kinesthetic creature first, then auditory and then visual. This order is in line with the way physical development is accomplished in a mother's womb. That being the case, among our sense organs, eye is still the most credible and reliable organ despite all the perception managements… That is evident in the sayings that are popular in the society such as "I won't believe if I do not see it myself" "I believe what my eyes see". On the other hand, 21st century human has been designed primarily as a visual creature as it has never been before. Capitalist system has generated a new type of human which is supported also by the creative side of the digital age: human who obsessively consumes, believes they become anything they want by consuming, think that consumption is the meaning of their life, who build their self-confidence on consumption and therefore who do not think… If they take the time to think, they will not consume that much; if they take the time to think, they will not be the pawns in the game of divide and rule. It seems like every medium which is not related to the action of reading or which reduces the action of reading to the lowest level and which is based on visu-ality will become even more prominent in the upcoming years.

So it can be inferred that a human's rate of interaction with visual materials changes depending on being less or more mindful. This must be true for the whole world. We cannot claim that education is the only way that leads to mindfulness. For example there are some literacy train-ings which specifically focuses on certain mediums… Cinema was introduced to Turkey even before printing, has not been radically interrupted and has been loved a lot. Cinema has natu-rally and intrinsically played a positive role in this fast development. It appeals to more than one sense, primarily sight, which is mostly analyzed once seen and therefore has a universal language; which alternates between dreaming, delusion and life's realities and which is inde-pendent…

In Turkish cinema of Yeşilçam period, female visuality came first. Visuality is a concept which encompasses attractiveness for a woman and is equivalent to beauty. Adjectives used for women such as beautiful eyes, full-figured body, slim waist, long hair are the reflections of the values of the general society about liking on female artists. One of these artists is Türkan Şoray: She has enabled conversion of praises of female appearance as embraced and supported also by women in Turkish culture with her eyes, eyelashes, looks, hair and full-figured body to a cul-tural code as done by women.

The purpose of this manifesto is to investigate and present how this process has started, worked and was converted into codes of visual culture.

Key words: Türkan Şoray, Visual Culture, Semiology, Face Reading, High-Set Eyes and Ears, Yeşilçam.

Introduction

It has been established by science that human babies know the sense of touch first which is followed by sense of hearing and eyesight which is the last sense to develop. Human fetus is able to open their eyes as of the twenty seventh week in the womb and tell day from night. An infant is able to clearly see up to thirty-cm distance immediately after their birth. As modern psychology, modern philosophy and some of the alternative philosophies assert that the time fetus spends in the mother's womb, the moment and aftermath of birth are of importance for human development and psychology, the period during which a human baby is born might be analyzed again in terms of each cultural texture. Perhaps findings of such researches may contribute to rise of utterly different awareness that is based on birth trauma in order to solve humans' shameful/shameless/discriminatory/egocentric violence policies towards female gender and their own species overall. Ultimately, the hypotheses which assert that human baby learns the attitudes and behaviors which are nurtured by cultural codes induced by human judgement as early as when it is in the womb and their existence on earth is shaped by this knowledge may become more important in near future.

This is surely not the subject of the manifesto but all of these aspects can be associated with the effort to seek an answer to the question of why cinema is and will be so effective on people by looking into the phase during which an infant starts to know the world. A mother's womb can be compared to a type of movie theater: infant mostly hears the sounds in the womb but is also able to see the light starting from the twenty seventh week. A movie theater might function as a medium which takes humans back to a phase which is very familiar for them and let them enjoy the eyesight with which an infant meets later than the other senses. In this sense, 21st century will continue to be visual in every medium but it can be foreseen that the most effective one among such mediums will be the movie theater where movies directed by talented and skillful directors who are visionary enough to reach a wide audience or the productions which enable simulation that feels like cinema. Today the reason why cinema is not effective might be the rareness of the movie makers who are able to find the elements which would appeal to the human identity which is lost in the changing digital mediums and to the humans who are lost but who are also incredibly informed about everything and who is satisfied with and almost bored of different and new things. All of these visual human definitions are applicable for wide social communities and majority of educated people whose academic background has been shaped by the capitalist understanding.

How Does Türkan Şoray Show Sympathy?

(Now let's take a look at the process during which Türkan Şoray's eyelashes turned into a knitting model)

You can understand from Türkan Şoray's looks (spiritual, emotional world), posture (body language) that she shows sympathy. For example, a semiological study may reveal to what extent a star is effective in creating the meaning of a movie. In such a study, star is one of the means of creating the meaning of a movie." (Büker; Uluyağcı, 1993:11) "… a visual presentation which is worth a thousand words … (Zileli, 2009:63) Türkan Şoray easily does this through her personality, character, surely her ability to convey meaning and especially through the way she looks. She already experiences those feelings. As soon as Türkan Şoray is on screen, she is easily grasped

by the audience with her entire attitude and behaviors, in other words, audience can easily analyze and internalize her. Even this is enough for her to be successful.

One does not become a star by coincidence. Star is born when physical beauty unites with a stereotype, a character which appeals to the audience for a certain period of time. Stars are born out of needs. For different reasons, audience seeks an idol who embodies certain qualities. They need the idol. When they meet once, it is a necessity to maintain this relationship because star has a psychological and sociological function now." (Büker; Uluyağcı, 1993:20) Şoray is one of the rare actresses who is able to build this link both psychologically and through her body language. Is it possible to tell spiritual language from body language? Some people can put on and take off their masks easily, which means that the bond between their inner and outer world is already broken. Şoray maintains this bond all the time; the reason might be that she can keep her integrity while most people cannot. It should be noted that humans always long for kindness and honesty at heart. On the other hand, Şoray has always fears, reservations, never-ending modesty and shyness (Dorsay, 2013: 6) and these characteristics of her will always appeal to large masses and she will deserve the title of Sultan. She was sixteen years old when she was first introduced to Yeşilçam. She had a fully-figured body and therefore her face looked childish because of her age and

rdeşi Nazan ve annesi Meliha Şoray'la birlikte.

wider because of her weight. Her eyes are ready to make its rightful impression on such a wide face. A little bit of dental aesthetics: the front teeth; and the eyebrows must be plucked but still look natural and the beauty of her eyes will be spectacularly evident when she loses weight. The fact that her face and body have a golden ratio contributes significantly to her being accepted as a symbol of beauty. People find golden ratio beautiful although they are not aware of it. Şoray has quite a symmetrical face.

Atilla Dorsay writes in the anecdote that belongs to Türker İnanoğlu: "Her eyes used to penetrate deeply into one's heart. They were extremely beautiful. Cinema had not seen a more beautiful woman than her so far. I was so impressed by this brunette lady that I opened up to the producer Zeki Çan that night. She was exactly whom we were looking for the role. She was much better for the role than Emel Yıldız and, on top of it, she was younger and more beautiful than her." (Dorsay, 2013: 6). This anecdote reveals both working principles of Yeşilçam and the popular male attitude towards women in the society regardless of whether men are educated or not. An attitude which is based on the idea that women exist for men.

However; the idea that women are created for themselves must prevail. Can women be reduced to a means of ensuring survival of human species? The period when she becomes even younger, more beautiful, reaches the age when her beauty is at the top level and the beauty of her eyes become evident follows that. That must be what they call star quality. Ümit Çeliker reminds the words of an elderly journalist: "There is not a single Turkish man who does not find Türkan Şoray beautiful… That is not possible." (Büker; Uluyağcı, 1993:29) Perhaps the dominant male attitude inclined to define shy, timid, obviously in need of protection (economically disadvantaged), innocent but who are definitely younger and more beautiful women as having 'eyes which penetrate deeply into one's heart.

Eyes, Eyes, Eyes, Eyelashes Each of Which is As Penetrating As an Arrow…

The Sultan's Eyes

Lights went of in the darkened halls
We held our breathes in expectation
Our bodies on edge
The silver screen shuddered from our gaze
It was the Sultan's eyes
Inviting us to great dreams
Telling us Tales
From the big times of the heart
……..
Murathan Mungan

Praises of Türkan Şoray's eyes, eyebrows and eyelashes which turned into the on-screen symbol of female beauty complimented by Turkish people of literature for centuries also imply the inclination which exists both in folk literature and divan literature and therefore inherited into genetic codes of the society.

Women designed the knitting model out of the model of her eyelashes starting from the 1960s and taught it to one another. Her long and rich eyelashes which open like a ray continue to inspire the false lash websites today.

Türkan Şoray type of eyelashes / I am learning to knit / Bakı; people use this knitting model to use with both needle and crochet hook. There is a model called Zeki Müren's teeth which can be knitted only with a needle of Zeki MürenEyelashes which are the ornaments of eyes became one of the means of promotion to increase the sales of digital market starting from &0s: http://urun.gittigidi-yor.com/kozmetik-kisisel-bakim/turkan-soray-kirpigi-diyoruz-

Arch brows, losing weight, a slim face made her high-set eyes evident, which are called cute in society. High-set eyes in the eye hole: "if whites of eyes are visible on the sides and below the iris, it means they are high-set in the eyehole (Brown, 2002:41). High-set eyes may enable one to have deep and meaningful eyes but the main factor that makes eyes beautiful is their size because big eyes are the symbol of ideal beauty. One wears make-up to make their eyes look bigger (Brown, 2002:41). Şoray's face is symmetrical and round-shaped. In society, the adjective of two-faced is used to indicate that right and left side of one's face is distinguishably different from one another. According to the science of face-reading which is prevalent in Far East Asia and which has started to become popular also in the West, an honest face is symmetrical. A round-shaped face implies a wide face in general. It is related especially to the width between two temples. People with such a face are stable. Their behaviors are usually balanced and they use their common sense to solve problems (Brown, 2002:25). Evident cheeks are also the indicator of people who love to share their feelings (Brown, 2002:46).

Briefly: It is not a coincidence that she has become a symbol of beauty of Yeşilçam screen. Her star quality, physical and spiritual characteristics appealed to a large mass, were approved and even blessed. Her straight eyes took the shape of an arch in time, her slightly crooked nose was fixed with an aesthetic operation, she lost weight, her wide face became slimmer, her childish face became more formed in time; the fact that she has thin wrists and ankles, her posture is good-looking, her body is not unattractive, she has shy and naïve eyes so Şoray has managed to become a successful means of expressing emotions and behaviors of Turkish people even with her existence.

Although her childhood pictures reveal that she was able to use her eyes to express herself even when she was a child, the actress tells that she has learned to give meaning to the way she looks in time especially from a director.

Conclusion

Şoray who believes at heart that women exist for themselves and who have maintained her relationship which started when she was eighteen years old for a long period of time in a society that is bound by some traditional rules and who has even become a subject of an column written by Rauf Tamer who said that if Türkan Şoray does it, it is called love stated that Şoray has a privileged place in this society woman is weak in this society: Rüçhan Adlı is the man who was possessive towards her, who protected her, took care of her and her wellbeing and who called her Sultan. It seems inevitable not seeing the existence of a man in the eyes of a woman, who values her in the society where she was born and lives.

We should look at the fact that Hürrem Erman who made great personal efforts and contributed significantly to the increase in the number of viewers in Yeşilçam's success and in the Turkish movies recently, the enhancement of domestic and foreign markets. (Kara, 2006:8)

For Halit Refiğ "West's insulting attitude which looks down on the cultures which are different from their own is an important issue which is not acceptable at all, must be criticized and struggled with strongly. It is the clear indication of the reason why she has become an idol. She has not acted like the Westerners and has not insulted and looked down on her society like a small bird which has just hatched. That was contrary to the general inclination on this country because generally they generally insult and look down on large masses instead of understand and finding solutions for them. She did not do that.

In the 60s, American cinema introduced the whole world a new life style and new car models which they had not seen ever before. A new thing which was not seen and could not even be imagined by people… "it seems inevitable that some conditions are met for people to have greater interest in a movie. Advertising, famous people, easily understandable narrative and a certain plotline with ups and downs… "it is normal that commercial movies which provide an opportunity for people to escape from their own reality or which make them see the reality from a safe distance, which are easy and not exhausting attract more viewers.": (Ceylan, 2012:55) If movie theaters have lost their earlier effect, that is the problem of those who control this industry… Cinema will always exist thanks to those mindful people who have a good command of the age's characteristics and human nature.

Atilla Dorsay: "A life becomes deep and meaningful only when it is addressed with other lives around it and life stories of other people who accompanied that life." It should not be ignored that it changes depending on the personal characteristics of the person.

Attention: Special attention has been paid to make sure that this article does not contain any sexist words which push women into the background. Although I make sure that my articles do not contain such words, this is the first that I have been using this expression; in this regard, I am its patent holder and I foresee that more and more articles will start to be written this way within a short period of time.

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DETECTING CELLS USING IMAGE SEGMENTATION OF THE CERVICAL CANCER IMAGES TAKEN FROM SCANNING ELECTRON MICROSCOPE

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Abstract: In this study, Matlab basic cell processes have implemented normal, benign and malign cervical cells taken from the Scanning Electron Microscope. These matlab basic cell process are binary gradient mask, dilated gradient mask, binary image with filled holes, cleared border, segmented, and outlined original. According to the results obtained after these operations, a difference has observed for malign image in images obtained from binary gradient mask, dilated gradient mask process. White space that is obtained after binary gradient mask and dilated gradient mask process applied to the malignant images were found to be much more than normal and benign images.

Keywords: Cervical Cancer, Matlab Basic Cell Process

Introduction

Cervical cancer is said that almost 288,000 deaths each year all over the world is the second most common cancer among women (Grubisic G, Klaric P, Jokanovic L, Soljacic Vranes H, Grbavac I, Bolanca I. 2009). cancer morbidity and mortality was determined 27 or earlier cancer can be reduced in the continuous case. In particular, such as the Pap smear for cervical cancer can be reduced. (Costa S, Negri G, Sideri M, Santini D, Martinelli G, Venturoli S, et al. 2007). Liquid-based cytology helps to reduce the percentage of 70-80 percent mortality of cervical cancer (Hanley KZ, Tadros TS, Briones AJ, Birdsong GG, Mosunjac MB.2009). The most important advantage of this test is simple and is the least invasive (Hoda RS, Colello C, Roddy M, Houser PM. 2005). These tests are effective and successful, although from what was expressed as the detection of preinvasive cervical lesions are located an average sensitivity of 55% (Saslow D, Runowicz CD, Solomon D, Moscicki AB, Smith RA, Eyre HJ, et al. 2002). invasive carcinoma detection accuracy is not perfect and show the different ranges of between 55% and 80% indifferent research (Benoit AG, Krepart GV, Lotocki RJ.1984). According to data provided by the American Cancer Society, about 3.6 million are classified as suspicious histological tests in the United States each year (Soost HJ, Lange HJ, Lehmacher W, Ruffing-Kullmann B.1991).   .

There are only 8% of women are preinvasive lesions and invasive carcinoma during tissue biopsy 0.4%. 95% of the true negatives and provide relatively high (Nanda K,McCrory DC,Myers ER, Bastian LA, Hasselblad V, Hickey JD, et al.2000). Therefore, a more accurate by eliminating the additional steps of test criteria biopsy and colposcopy, HPV DNA screening can reduce the cost and patient discomfort. In this study is a developed different solution using Scanning Electron Microscopy (SEM) images. In this study, Matlab basic cell processes have implemented normal, benign and malign cervical cells taken from the Scanning Electron Microscope. These matlab basic cell process are binary gradient mask, dilated gradient mask, binary image with filled holes, cleared border, segmented, and outlined original.

Materials and Methods

Image segmentation is the first step of the automatic picture pattern recognition and image analysis problems (Costa S, Negri G, Sideri M, Santini D, Martinelli G, Venturoli S, et al. 2007). Segmentation is the separation to constituent parts of image (Hoda RS, Colello C, Roddy M, Houser PM. 2005). The image segmentation process aiming grouped according to common characteristics of pixels, is intended to be a minimum of diversity in accordance with the criteria selected group obtained. In the literature, there are many segmentation algorithms. The most commonly used algorithms are algorithms such as Fuzzy c Means, K-means, such as Watershed. Proposed system used in this study is show in Figure 1. Segmentation used in this study was performed in stage 6.
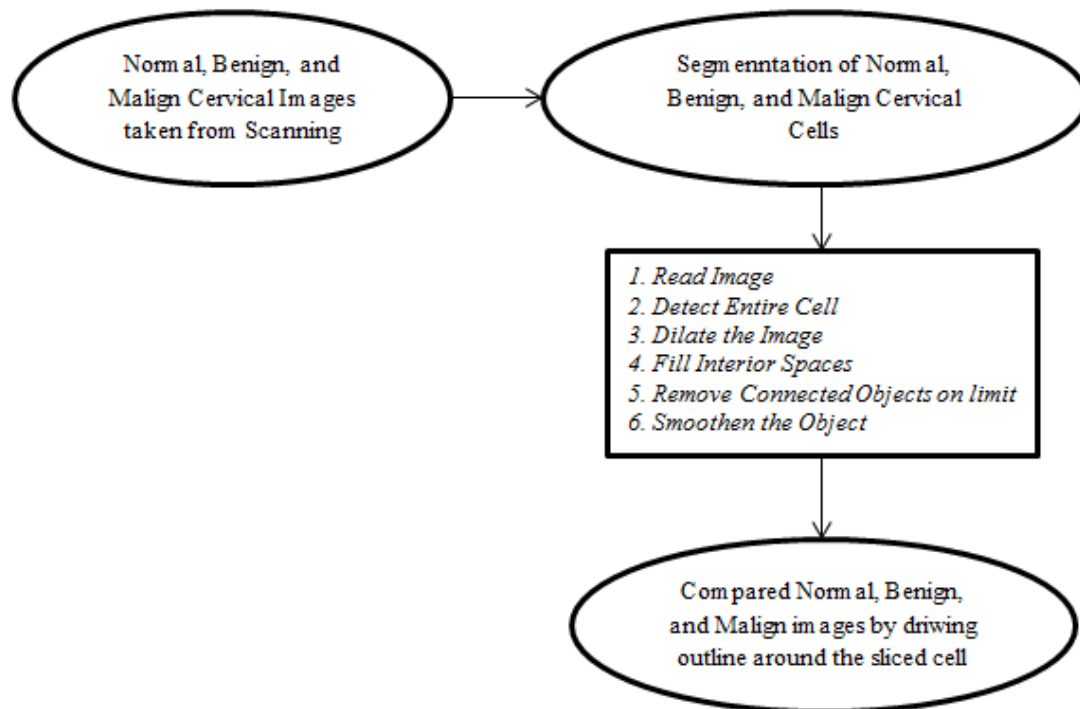
Figure 1. Proposed system in this study

Stage 1. Read Image

Read in the normal.tif, benign.tif, and malign.tif images, which are images of a cervical cancer cell (Mathworks. 1994-2016).

Stage 2. Detect Entire Cell

Cells are present in images. These images will detect cells. In other words, it is segmentation. Parts Separated image differs greatly in contrast to those in the background image. Changes in contrast can be determined by operators that calculate the gradient of an image. The gradient image can be calculated and a threshold can be implemented to create a binary mask containing the segmented cell. First, in this study is used edge and the Sobel operator to calculate the threshold value. Then, binary masks with threshold and edge cells are taken again (Mathworks. 1994-2016).

Stage 3. Dilate the Image

Binary gradient mask illustrates the route of high contrast in the image. These routes are not fairly that has strengthened the outline of the object of interest. Compared to the original image, the gradient of the line can be seen in the space surrounding the masked object. These linear gaps will lose if the Sobel image is expanded using linear structuring elements. The binary gradient mask is expanded using the vertical structuring element followed by the horizontal structuring element. The imdilate function is expanded   the image (Mathworks. 1994-2016).

Stage 4. Fill Interior Spaces

It shows quite a nice gradient mask expanded cell lines, but they are still holes in the interior of the cell (Mathworks. 1994-2016).

Stage 5. Remove Connected Objects on limit

The cell shas been successfully segmented. Any objects that are ligated to the border of the image can be eliminated using the imclearlimit function. The connectivity in the limit function was set to 4 to eliminate diagonal connections (Mathworks. 1994-2016).

Stage 6. Smoothen the Object

Finally, the image is shown for a smoother more natural look of the piece object. Cervical cancer images are created the diamond structuring element using the streel function. An alternate method for demonstrate the sliced object would be settle an outline around the sliced cell. The outline is composed by the bwperim function (Mathworks. 1994-2016).

Results and Discussion

In this study is a developed different solution using Scanning Electron Microscopy (SEM) images. In this study, Matlab basic cell processes have implemented normal, benign and malign cervical cells taken from the Scanning Electron Microscope. These matlab basic cell process are binary gradient mask, dilated gradient mask, binary image with filled holes, cleared border, segmented, and outlined original. According to the results obtained after these operations, a difference has observed for malign image in images obtained from binary gradient mask, dilated gradient mask process. White space that is obtained after binary gradient mask and dilated gradient mask process applied to the malignant images were found to be much more than normal and benign images.

Figure 2. Normal cervical cell image
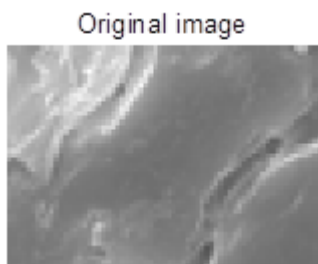
Figure 3. Grade converted image of the normal cervical cell

The larger the cell nucleus in Figure 3 was observed locally thickened.

Figure 4. Breaking of the edges with Sobel operator cell of normal cervical cell

In Figure 4 is remarkable the clutter of the edges. It shows the high-contrast areas of the image.

Figure 5. Obtaining of the enlarged edge

In addition to made processing in the above, by expanded of the edges in Figure 5 were found to be more dispersed.

Figure 6. Image which uncovered gaps in the internal portion of the image

In Figure 6, the edges are unloaded and revealed large gaps.

Figure 7. Limits cleaned image

In Figure 7, it is seen that the boundary portions becomes clear.

Figure 8.   Segmented image

In Figure 8, the image has a more natural impression.

Figure 9.   Outline determined image

In Figure 9 shows outline determined image
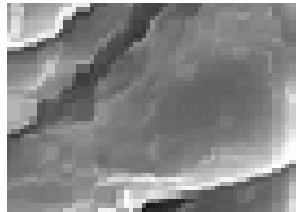
Figure 10.   Benign cervical cell image
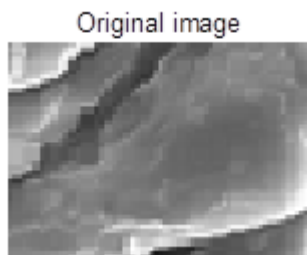
Figure 11.   Grade converted image of the benign cervical cell

The larger the cell nucleus in Figure 11 was observed locally thickened.

Figure 12.   Breaking of the edges with Sobel operator cell of malign cervical cell

In Figure 12 is remarkable the clutter of the edges. It shows the high-contrast areas of the image.

Figure 13.   Obtaining of the enlarged edge

In addition to made processing in the above, by expanded of the edges in Figure 13 were found to be more dispersed.
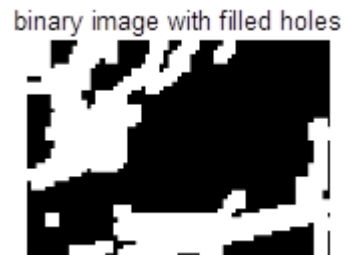
Figure 14.   Image which uncovered gaps in the internal portion of the image

In Figure 14, the edges are unloaded and revealed large gaps.
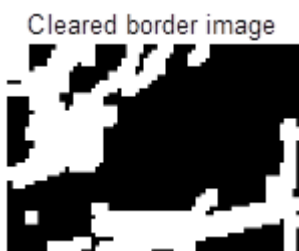
Figure 15.   Limits cleaned image

In Figure 15, it is seen that the boundary portions becomes clear.

Figure 16.   Segmented image

In Figure 16, the image has a more natural impression.

Figure 17.   Outline determined image

In Figure 17 shows outline determined image.
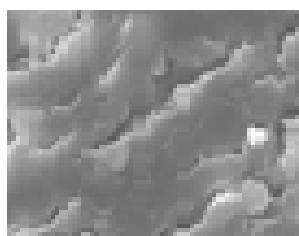
Figure 18.   Malign cervical cell image
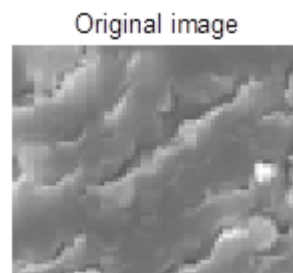
Figure 19.   Grade converted image of the malign cervical cell

The larger the cell nucleus in Figure 19 was observed locally thickened.

Figure 20.   Breaking of the edges with Sobel operator cell of malign cervical cell

In Figure 20 is remarkable the clutter of the edges. It shows the high-contrast areas of the image.

Figure 21.   Obtaining of the enlarged edge

In addition to made processing in the above, by expanded of the edges in Figure 5 were found to be more dispersed.

Figure 22.   Image which uncovered gaps in the internal portion of the image

In Figure 22, the edges are unloaded and revealed large gaps.

Figure 24.   Segmented image

In Figure 24, the image has a more natural impression.

Figure 23.   Limits cleaned image

In Figure 23, it is seen that the boundary portions becomes clear.
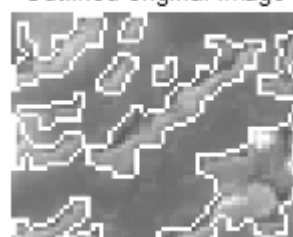
Figure 25.   Outline determined image

In Figure 25 shows outline determined image.

Conclusion

Image segmentation is the first step of the automatic picture pattern recognition and image analysis problems [2]. Segmentation is the separation to constituent parts of image [4,5,6]. The image segmentation process aiming grouped according to common characteristics of pixels, is intended to be a minimum of diversity in accordance with the criteria selected group obtained. In this study, Matlab basic cell processes have implemented normal, benign and malign cervical cells taken from the Scanning Electron Microscope. These matlab basic cell process are binary gradient mask, dilated gradient mask, binary image with filled holes, cleared border, segmented, and outlined original. According to the results obtained after these operations, a difference has observed for malign image in images obtained from binary gradient mask, dilated gradient mask process. White space that is obtained after binary gradient mask and dilated gradient mask process applied to the malignant images were found to be much more than normal and benign images.

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DIGITAL STORYTELLING AND TRAINING IN HEALTH CARE SETTINGS

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Abstract: This article presents a research carried out at a hospital in northern Italy where digital storytelling (DST) was used for health personnel training. A digital story is a short story narrated in the first person using multiple languages: images, music, sound and film sequences. This narrative methodology was chosen to achieve three main objectives: 1) encourage deep reflection and emotional mediation by the use of more expressive codes; 2) build a collection of digital stories produced in narrative workshops for training in health care; 3) reduce the distance between care settings and care users through the online publication of digital stories. The project phases and the results achieved are discussed.

Keywords: Digital storytelling, training health care settings, training.

Introduction

Since the mid-1990s, when we have come to the formalization of the concept and the practice of narrative medicine (Charon, 2006), there has been a proliferation of experiences that have seen narrative methodologies at the center of numerous healthcare interventions. Disease and patient histories have begun to represent a fundamental ingredient in medical practice, allowing to develop and interpret the bio-psycho-social approach in various contexts of care.

The introduction of these methodologies did not only cover clinical practice, but has led to many reflections on the use of these stories in health education. Hunter argues that the best clinical teaching is the one that comes from the patient (Hunter, 1991), highlighting how the disease stories do not deplete their function in the medical-patient dyad, but represent an important carrier for the transmission of knowledge and skills addressed both to healthcare personnel and to people in different forms of patient education.

From the Nineties onwards there are numerous projects, born in different contexts, aimed at gathering disease stories and promoting narrative processes in suffering contexts. Also thanks to this diffusion, narrative strategies and methods used in the socio-health field have known various processes of dissemination and evolution.

In this context, the use of Digital Storytelling (Lambert, 2002) has become more and more important: it is a narrative practice based on first-person narration through voice, images, and music. Digital storytelling (DST) has also been established in healthcare environments thanks to projects such as Patient Voices (Hardy & Sumner, 2014).

The research presented in this paper deals with the use of DST in the training of health care personnel according to a twofold approach: 1. Direct. Intended to promote reflective and narrative skills in professionals; 2. Indirect. It concerns the acquisition of the strategies needed to manage DST laboratories with patients.

We chose digital storytelling for a number of reasons, including:

1. Multimedality, which represents an added value especially when criticalities in the written composition may be present. The opportunity offered to the narrator to use different languages allows people to enhance their expressive ability. In addition, it offers valid strategies for the representation of complex concepts that sometimes do not find words to be the best vehicle for transmission. Multimedia opens up an aesthetic dimension that is well matched with the emotional component of the DST, especially when it has to do with nursing care.
2. Involvement. In continuity with the previous point, the use of multiple languages allows the creation of stories capable of wrapping the spectator and carrying it to an active and interpretive listening dimension.
3. The synthetic narrative that responds adequately to two needs: a) reducing the storyteller's investment of time; b) to reach the addressee in a very direct and immediate way.
4. Transmission potential. Among the characteristics of the DST there is the ability to enhance the emotional reach

of the stories, creating the appropriate ground for the definition of forms of empathy that are particularly effective in socio-sanitary communication contexts.

5. Thoughtfulness. Narration has the ability to activate forms of reflection and meta-reflection both in the storyteller and in the beneficiary. This capacity is enhanced, in DST, because every single ingredient (images, music, text) requires, to be selected, an intense activity of analysis, reflection and meta-reflection that leads the narrator to cross many often interesting and enriching paths towards self-knowledge that sometimes can be an important factor in self-care.

The research-action project is based on the collaboration between the Department of Philosophy and Education Sciences of the University of Turin and the Training Department of the Hospital of Biella, a small town in Northern Italy. The Director of Education, Vincenzo Alastra, has based much of the training and education activities directed at healthcare professionals and patients on narrative methodologies (Alastra, 2015). In this direction, different strategies have been explored ranging from cinema, literature, poetry to photographic narratives.

Materials and Methods

Does multimedia narration promote professional reflection? Which processes are triggered during shared media narration paths within professional groups? Can DST support patient narrations?

These are some of the questions from which we started when we decided to introduce the DST methodology in educational actions with operators and patients.

Specifically, the experience was carried out with two distinct groups of "narrators":

1. a group of five healthcare workers (4 nurses and 1 health-care worker) who had previously been formed on the narrative front and had activated narrative workshops with patients. The objective, in this case, was twofold: a. To stimulate a professional meta-reflection on narrative practices; b. Foster the acquisition of a new narrative competence for any other laboratories to be offered to patients.

2. a group of educators and people with mental disease (5 patients and 3 educators). Subjects belong to the same health service.

Let's start examining the experience carried on with healthcare providers. As mentioned, they had a solid professional background and worked through different narration seminars in health and education. As a matter of fact, they have followed numerous training courses in this field and they have activated at least one narration workshop in their professional contexts. The aim was to reconstruct and to make a critical analysis of these experiences with the intent of "re-rendering" them by attributing meaning and value to those aspects that in practice were lost or at least unexplored.

Because they were experts, it was decided to start using the DST both to further expand their know-how and to enable the creation of expressive forms that would allow a higher level of content sharing and the surfacing of latent meanings.

Their involvement took place on a voluntary basis and activity was carried out over a couple of months with two collegial meetings each month and part of the work done autonomously.

The DST workshop was organized in 6 phases:

1. Introductive phase. During the first meeting participants presented their participation to the lab and motivated it. The facilitators explained the working modes, the timing of work and the tools that would be used. In addition, narrative themes (dramatic questions, DQ) were defined, on the basis of which participants would tell their stories. The DQs all had a common basis that recalled the experience of narrative practice in the contexts of care.

2. Sharing stories. In the second encounter the stories, thought and written in autonomy, were shared and discussed in a group. This has allowed each narrator to make changes, to access aspects that are not considered, and to proceed to the definite writing of the story.

3. Pictures and audio accompaniment selection. Each author chose images that would allow to express and effectively represent contents and meanings of history. Once the various media elements have been identified, narrators have made the storyboard in order to make the work more linear in the next step.

4. Sharing images and music. Just as the stories have been socialized, so has been done with multimedia elements. In particular, there was a deep discussion about iconographic choices, not so much about defining the aesthetic value of the elements, but to reflect and analyze the meanings attributed by the narrators.

5. Editing. Stories have been assembled using Movie Maker, a simple sw for video editing.

6. Sharing the final product. Although all the elements of the DST had been presented and discussed in the previous phases, it was considered appropriate to devote a space to the visualization and analysis of the finished products, both to close the lab and to grasp those aspects and dimensions that only emerge in overall vision.

The second group represented a challenge from an educational and narrative point of view, both because of its size and its heterogeneous form. The group was out together in two different moments: at first the facilitators met the educators to plan the intervention, define the narrative objectives, and establish the criteria to be used in identifying the patients. The activity was proposed to those patients (all attending the same mental health service) who had already taken a certain care pathway and had reached a good level of disorder management. At a later time, educators joined the group because they wanted to share this experience with their patients to create a co-location and equality situation that was considered important at that stage of the care path.

Again, the activity was organized in phases as in the previous group, setting a timeline appropriate to the various needs of the participants.

At this stage, we will only focus on some of the moments we consider particularly interesting.

1. Involvement and definition of the narrative theme (DQ). As mentioned earlier, the identification of the people to whom the laboratory was proposed had to take into account a number of factors related to the disorder of each person, and to the potential and criticality of each individual. We chose to work with those people who had achieved good pathology control and found themselves in an existential phase of balance and change. For this reason, the dramatic question "My Life With" was proposed, which was intended to allow participants to project themselves into a "future" and generative dimension. In fact, the purpose of the intervention was to bring people to reflect on aspects of their lives that could be good starting points for a new existential design.
2. Finding and Writing Stories. This was a very complex phase that took several weeks. Operators and patients worked together in a context of strong collaboration aimed at identifying what could be told and how to do so. The two facilitators also supported the group in the choices, especially in the critical moments in which some participants expressed difficulties in identifying, in their existence, something deserving to be told.
3. Media Writing. The activity was carried out by maintaining the principle of maximum copyright and soliciting the use of original iconographic resources. When these were unavailable, storytellers organized moments dedicated to photography, in which patients and operators took the pictures they needed.

Facilitators
As mentioned above, two facilitators worked to the design of activities and managed the narrative laboratories. At the design stage, they worked on defining criteria and ways of involving patients, helping educators to define selection criteria based on the opportunities offered by this type of intervention.
Subsequently, they played a crucial role in sharing moments by managing the critical issues and by stimulating the necessary analysis and reflection to achieve a DST. Above all they encouraged in the participants an evolutionary and transformative process, with an intervention that wanted to be primarily educational and partly rehabilitative for patients and educative for educators.

Results and Discussion
We will present the results obtained, resuming the questions with which this text started.

1. Does media narration promote professional reflection?
The DST has proven to be a functional method of activating key meta-reflective processes in professional contexts. The ability to tell through different languages allows individuals to access a more creative and expressive plan than the one written. This is functional to the acquisition of knowledge and awareness (Carper, 1978).
Here are some comments that nurses from the first group expressed when, at the end of the seminar, they were invited to report their formative experience:

"This experience has allowed me to combine new skills with old knowledges, creating a versatile, simple and powerful expressive tool that can give voice to the care work. (...) This experience has prompted me to reflect on how much a nursing relationship can lead to exploring the world of beneficiary and curator emotions" (Laura)

"Realizing a DST has been the occasion to look at my work through a kaleidoscope, reassembling, in a new light, many of its components" (Silvia).

"I rediscovered the pleasure of photography, my old passion, finding old photos that I had taken and that, used in a precise sequence, expressed with all my satisfaction what I meant" (Laura)

As can be seen from the first comment, the added value of this narrative practice is represented by the possibility of expressing itself through multimediality. In addition, the choice of the different narrative components (images,

video sequences, music) enables the activation of professional memory retrieval processes and helps the professional to "put order" among the events.

2. Which processes are triggered during shared media narration paths within professional groups?

In general, there was a tendency to start very significant comparisons with regard to iconographic and editing choices. The discussions never mattered about the aesthetic dimension, but they focused on the coherence of pictures with respect to the meanings they had to represent. In addition, it should be pointed out how, tendentially, comparisons took place on a semantic plane to gradually shift to professional and emotional aspects. On more than one occasion, the empathic aspect has emerged, activated both by the personal story and by the research activity, especially of the iconic devices. Many of the operators involved claimed that the search for photographs led them to go back with their memory to experiences, facts, and people they had almost forgotten about. This has allowed them to find important pieces for the reconstruction of both personal and professional life. Although many of the nurses and educators involved in the project had already been involved in storytelling workshops and they were used to narrating their professional life, it was evident that DST has triggered reflection and analysis mechanisms which were different from what had happened with other strategies.

Another very interesting aspect is the importance of content represented by images and their impact on professionals. Although the participants of the two groups met each other, when they shared some images they had access to a deeper knowledge plan, which was precluded while reading stories. A change of perspective was noticed between the time when the narrative texts were shared and the time when the work with pictures started. It should be noted that participants were asked to only use original photographs and not to access online repertoires. This choice was motivated by both the respect of copyright and the need to minimize the risk of standardizing the performances, to allow, as much as possible, the creation of truly authentic tales.

The moments of sharing media choices have strengthened the group spirit and encouraged collaborative attitudes. This was even more intense when multimedia management has put narrators in the face of some technical critiques.

3. Can DST support patient narratives? The results of the group of people with mental discomfort lead us to assert that the narrative processes made possible within a DST path represent a scaffolding element for people with fragility. Specifically, it seems relevant in this regard to focus on some aspects that have emerged in a particular way:

1. The images facilitated the narration, especially for those people who manifested a greater discomfort in communicative and narrative processes. We take for example the experience of A., a very motivated patient suffering from severe schizophrenia, who at the beginning of the course, had manifested his difficulties in telling a story because he felt that he was absolutely incapacitated. The ability to use photographs and music has calmed down, allowing him to complete his work by achieving a high degree of satisfaction for his digital story.

2. Also in this case, as reported to professionals, sharing image selection has promoted a greater mutual knowledge among the participants. In addition, this activity has allowed forms of collaboration and, in particular, mutual support among patients. While in the "writing" phase of their story subjects kept a certain gap between them, whereas during shared media research activities it often happened that they mutually assisted and supported themselves in the face of the criticalities that sometimes the technological dimension presented to them. In particular, we mention the case of A. and S. that for several meetings ignored eachother, but when it was time to choose the images of S., A. began to participate and interact with S. activating forms of comparison to which we had never come to before. During the last meeting, when it was asked to participants what they thought about the experience they had participated to, one of them said that although they had known it for a long time, only at that time they could be considered a true group.

3. In closing, reference should be made to the effects of participation by operators and patients within the same group. A first reference should be made to the emotional climate that has been not only extremely positive and collaborative, but also serene and often fun, throughout the laboratory. Although people had exposed their weaknesses and shared very personal aspects of their existences, sometimes even particularly delicate emotionally, it was possible to maintain some joy in being "there" together to share that experience. This has been a highly motivating factor and has allowed everyone to overcome the criticalities that have emerged from time to time.

For the reasons given and for others that we do not mention here, we feel that the DST not only supported the narratives of the patients, but has allowed us to define relationships that were not built many years ago. This concerns not only the patients but also the relationships with the operators.

Conclusion

The experience with the two groups allows to highlight how DST can be a valid ally in the empowerment of people and in the self-valorization of their professional experience. With this process, the subjects involved are not just telling their professional history, but they are obliged to represent it. To do this people need to be able to reconstruct their own professional existence and to understand it so well that they can tell it through images or semantic devices that are effective but also extremely complex. Identifying the image that can properly represent a salient moment in your profession implies a strong awareness and the ability to arrange the elements that are a part of it. When reaching the goal storytellers will not just have the right photo for that specific sequence, but also a clear view of their position, their evolutionary process, and the acquired skills. This is a formidable result for people, especially for care professionals who are constantly running the risk of burnout, but at the same time it is a fundamental goal for healthcare organizations.

Other interesting aspects were observed during this experience. Here we focus on some of them:

a. During the socializing moments of the stories it was noticed that people tended to be completely absorbed by tales and, above all, much more open to communication, listening, and empathy. This aspect is fundamental when there is some social marketing aim on particular issues (mental health, disability, independent life).
b. Some participants have interpreted the story as a sort of demonstration of their ability to cope with situations and difficulties.

Inside the Biella Hospital, where the experiences have been carried out, new DST laboratories are active, always addressed to care professionals both of the hospital and other healthcare companies. This will allow us to further study this methodology and to achieve mainly two objectives:
1. to assess the actual impact on organizations;
2. to identify good practices that can be exported in contexts not strictly sanitary.

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DSM RECOMMENDATION FOR GOVERNMENT OFFICES: MNE APPLICATION

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Abstract: The demand on electrical energy has been constantly increasing. That can cause more problems when it is not consumed optimally. In order to avoid the waste of the electrical energy, new consumption tendencies must be implemented. To implement these new tendencies we need to know consumers habits and the amount of energy needed. This paper shows a study that has been conducted on schools in Turkey that are affiliated to The Ministry of National Education, The energy consumption habit was defined by using load reduction and load scrolling methods of Demandside Management with the aim to reduce the peak demand and scrolling the load to the appropriate time. Energy consumption of a given school in a given city of Turkey was examined in different phases in order to define different levels of electrical energy consumption specific to each phase. Accordingly, new education curriculum was proposed to use optimum electrical energy.

Keywords: Energy consumptation, Demandside Management, DSM, load curve, load reduction, load scrolling.

Introduction

Energy is one of the most important factors affecting the world economically, politically and socially. Electricity is widely used in developing technology and equipments that are offered to consumers in parallel. Electric energy systems consist of four main processes: production, transmission, distribution and consumption. The 1973 Oil Crisis, triggered by many changes from traditional past approaches to today's energy production and consumption habits, indirectly led to the idea of control by demand. In the second half of the 20th century, there were many scenarios in which the reserves of fossil fuels, such as oil and natural gas, will soon be exhausted (Onar, 2008). In this case, it is first thought that the energy to be produced should be met from renewable energy sources rather than from fossil fuels. In addition, several studies have been proposed to control or direct the behavior of the consumer. The concept of Demandside Management (DSM) first emerged in these years, and its first examples have been implemented in houses (Law, Alpcan , Lee , Lo , Marusic and Palaniswami, 2012). The method has various application methods such as peak demand reduction, filling low demand times, load scrolling, demand saving, strategic demand growth and flexible load shaping.

DSM consists of 3-step processes in the form of load survey, determination of the type of stability study on the load curve, and identification of the technologies recommended to the end user (Violette, 2007). As can be seen, the first stage of the process involves the detailed load curve analysis (Rahman, Rinaldy, 1993). For this purpose, information about the basic functions to be used, the load model, the consumer model, the relationship between the producer and the consumer, and the expected future production costs are collected (Matsumoto, Takamuki, Mori and Kitayama, 2000). It will also be possible to comment on the network uncertainty that needs to be addressed. Another advantage of DSM is that load management for multiple consumer groups can be performed at one time instead of managing the load of a single consumer during the process (Merkert, Harjunkoski, Isaksson, Saynevirta Saarela, Sand, 2015). Accordingly, various schedules and smart meters capable of remote reading and control have also been integrated into the system (Öztemür, Soysal, 2013). Thus, the spread of the DSM in the regions where industrial loads are present has also been opened up.

In addition to the above, it is also important at which times consumption is made. Accordingly, tables are prepared according to variable electricity prices. Today, well-formulated mathematical software models offer opportunities for energy management planning in the industrial sector as well as production. Thus, continuous, cost-effective and efficient systems can be created (Özil, 2006). The nationality of DSM programs to be prepared must be appropriate to the electricity production-consumption structure of the country (Mohsenian-Rad, 2014). Thus, adaptation to the special circumstances of the country will be easier.

Many theses and articles on DSM are in the literature. In the thesis study carried out by Olgun, the planning of electricity consumption and demand side management in the tourism regions of our country has been covered (2009). Olgun worked on supply chain management, demand forecasting methods and the application of an artificial intelligence based demand forecasting model (Olgun, 2009)

In his study of Güral, he reviewed energy demand forecasting for power systems planning (2010). Başaran made a demand-side analysis of the performance of the electricity sector (2011). Zehir designed the demand side management system for thermostat controlled loads of intelligent networks (2013) Energy balancing in intelligent networks was studied by Alagöz under variable production and variable demand conditions (2015). In the same year, Bektaş made a sample of three consumer applications in the demand side management of electricity by Bayesian game approach (2015).

The DSM activities included in these studies were made using DSM's varieties of consumption reduction and load scrolling operations. In addition, renewable energy sources within the application portion of DSM methods can be used to reduce fossil fuel use. The use of renewable energy sources increases efficiency in transmission and distribution networks and ensures efficient use of equipment in the grid. This facilitates the management of distributed production systems and reduces the amount of lost power (Eissa, 2011).

When all the literature is examined, no work has been done in our country regarding official departments and / or the education sector. As it is known, the education which has 2 semesters in our country can be 3 semesters in various countries of the world. This study is carried out in order to understand which of these two cases is appropriate for my country in terms of DSM and to examine the effect of our country on the cargo curve. A pilot school has been identified for DSM application to be used in the Ministry of National Education (MNE) and energy consumption curves have been obtained. From this point, it was determined that for the MNE schools in our country, 3 periods instead of 2 periods would be better in terms of regulation of the load curve.

Material and Method

In this study, active and reactive consumption data of Konya province İnce Karalar Imam Orator School have been obtained for DSM study. For this purpose, a custom-made energy analyzer, communication devices that can use the RS485 communication protocol, and software and server material that can be recorded and interpreted by the modem are used as material.

Nowadays, the instantaneous changes in the networks are controlled from the virtual environment. The availability of control from the virtual environment and the absence of fossil resources increase the share of renewable energy resources in the system. The addition / removal of renewable energy to the system increases the flexibility of the supply-demand graph. Control of the supply oriented of the energy is possible by controlling the energy consumption habits of the users. All applications for users' energy consumption habits and the ability of the network users to respond to the energy claim are under the heading of the Requesting Party Management (RPM). Many methods are applied in the Party Side Management. Demandside Management: Methods such as peak demand reduction, filling in low demand times, strategic demand saving, strategic demand growth, load transfer and flexible load shaping can be applied (Strbac, 2008)

From these methods it is possible to avoid or shift to new investments with traditional load management methods, such as decreasing peak demand, filling in low demand times and load scrolling. However, demand savings, strategic demand growth and flexible load-shaping methods systematically reveal new ways of consumption and habits, as well as changing peak valley structure (Özil, 2015). The graphs of all the mentioned methods are given in Figure 1.
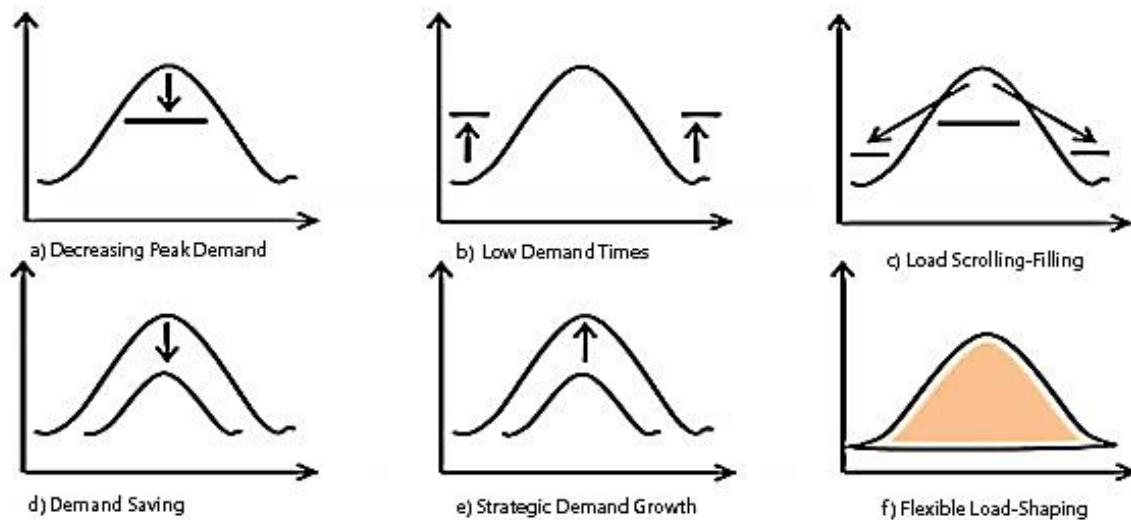
Figure 1: Demandside Management Strategies (Gellings, 1985)

It is used as the two most commonly used basic methods which are considered to be the most important of the DSM methods mentioned in the study. The first is the load reduction and the second is the load scrolling. With these methods, it is possible to reduce the peak demand and scrolling the load to the appropriate time. In this article monthly and annual load graph data of Ince Karalar school was obtained and the above mentioned methods were applied. The obtained load curves determined the energy supply of the building. DSM methods aim to achieve supply-demand balance of this energy.

The data obtained from the load curves are used to determine the periods when the load is peaked. Accordingly, the load determination scheme is given in Figure 2.
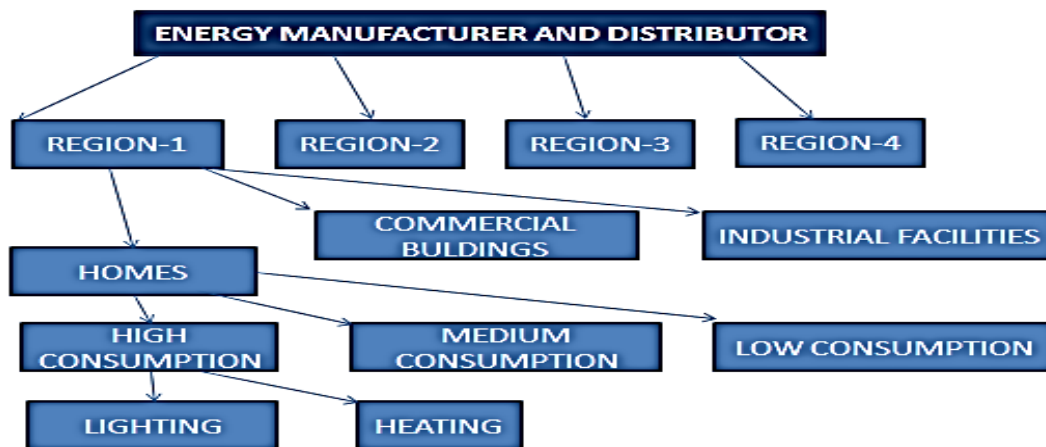
Figure 2: Load determination scheme

In Figure 2, the load determination scheme is categorized by manufacturer and consumer. These regions, which are classified later, are divided into three main divisions, namely residential buildings, commercial buildings and industrial facilities. Each of these is subdivided into high consumption, medium consumption and low consumption. Consumer units can be considered as the lowest step as heating and lighting.

The study was also used for lighting and heating departments, which are defined as the lowest unit of the load-allocation scheme for demand reduction and load scrolling methods from DSM methods.

Decreasing PEAK(puant) Demand

In this study, lighting loads were investigated in order to reduce peak demand from DSM. Bulbs used intensively in lighting such as incandescent lamp, fluorescent lamp, led lamp and led panels. Within the scope of the study, Ince Karalar was chosen as the pilot school for Imam Orator Middle School DSM.

The school has an energy analyzer, an RS485 communication device, and a system in which communication mode is installed. For this reason, the amount of electricity consumed by any school will be connected to be monitored

and similar studies can be carried out. The study is the determination of the energy consumption systems used in the school building. The pilot school was identified as a consumption system, a lighting system and a heating system. However, examination of heat loads has not been studied in this study since the Department of Mechanical Engineering is interested. In the second part of the work, the lighting system is determined. The most important equipment that makes up the lighting and is effective in energy consumption are lamps. In the next step, the lamp types are compared and the ones that are economically for the duration of equal use have been determined. The amounts of power, unit prices and lifetimes are given in accordance with Table 1.

Table 1: Power, unit price and lifetime according to lamp types.

Lamp Type	Power (Watt)	Unit Price (TL)	Life (h)
Incandescent Lamp	100	0.75	750
Fluorescent Lamp	23	5	10000
Led Lamp	10	10	50000

According to Table 1, the longest life-length is the LED lamp. Therefore, how many of the other types of lamps to be used within the lifetime of the LED lamp can be calculated as follows:

$$\text{Number of lamps} = 50000/\text{Life} \tag{1}$$

Equation 1 calculates that 66.66 incandescent lamps, 5 fluorescent lamps, 1 led lamp are needed for the same job. Then the amount of energy that each lamp type spends in 50000 hours can be calculated in Equation 2 below.

$$energy = \text{power} * \text{time} \tag{2}$$

In Equation 2, the amount of energy consumed was calculated as 5000 kWh for the incandescent lamp, 1150 kWh for the fluorescent lamp, and 500 kWh for the led lamp for 50000 hours. In the next step, the saving rate is checked to determine which lamp type is economical. The saving ratio between the incandescent lamp with the highest energy consumption and the LED lamp with the lowest energy consumption can be calculated in Equation 3.

$$SR = \left(\frac{\text{E}(Incandescent) - \text{E}(Led)}{\text{E}(Incandescent)} \right) * 100 \tag{3}$$

In Equation 3, the saving rate between the LED lamp and the incandescent lamp was calculated as 90%. Then the cost of energy amount calculated for 50000 hours of operation time according to lamp types can be calculated by Equation 4.

$$M(Energy\ cost\ to\ be\ consumed) = \text{A}(Amount\ of\ energy\ to\ be\ consumed) * (\text{Current electricity price}) \tag{4}$$

In the above equation, the current electricity price is taken as 0.40 TL. The energy costs to be consumed according to this equation are calculated as 2000 TL for incandescent lamp, 460 TL for fluorescent lamp and 200 TL for LED lamp. In the next step, the hardware costs of the system must be calculated in addition to the cost of energy consumption. The previous steps calculated the number of lamp types to be used for a working time of 5000 hours. Accordingly, hardware costs can be calculated in Equation 5.

$$Cost\ of\ Hardware = \text{piece} * \text{Lamp price} \tag{5}$$

According to the types of lamps to be used, the hardware costs are calculated as TL 50 for incandescent lamps, 25 TL for fluorescent lamps and 10 TL for LED lamps. Finally the total cost is calculated according to lamp types. The total cost equals the sum of the cost of energy consumed and the cost of equipment. The total costs are calculated as 2050 TL for incandescent lamps, 485 TL for fluorescent lamps and 210 TL for LED lamps. The school selected as the pilot region as a result of the operations; The total savings rate was found according to the number of lighting fixtures used in classrooms, management, dining hall, technology room, corridor and wet floors for 50000 hours of operation. According to these calculations, it can be determined which lamp will use the least amount of energy. The aim of the process is to reduce the demand and reduce the demand from the DSM.

The study selected the pilot school and the appropriate lamp type was determined, then the amount of energy and total costs requested for İnce Karalar İmam-Orator Middle School for 5000 hours of operation were calculated.

From the DSM strategies to be implemented in MNE, new strategies should be developed in accordance with the load curves obtained as well as the application of armature replacement and mantle to reduce illumination and heating costs. To this end, a new academic calendar is proposed, in which a scrolling study from DSM methods is carried out. According to İnce Karalar İmam-Orator Middle School, which is determined as pilot region for the application of DSM methods, according to the MNE academic calendar, it regulates education and training periods. The semesters consist of four semesters determined by the MNE: 1st, 2nd, 3rd and Summer vacation. The load curves belonging to these periods were obtained from the İnce Karalar Imam-Orator Middle School where the selected monitoring system was installed. Periods are Summer Between July and September, 1st between October and January, between February and February, March and June. Accordingly, the consumption curves for the year and for all periods are given in Figures 3, 4, 5, 6 and 7 respectively.

Load Scrolling
As a pilot school, İnce Karalar İmam-Orator Middle School is affiliated with the National Education of Ministry as of 07/02/2015.
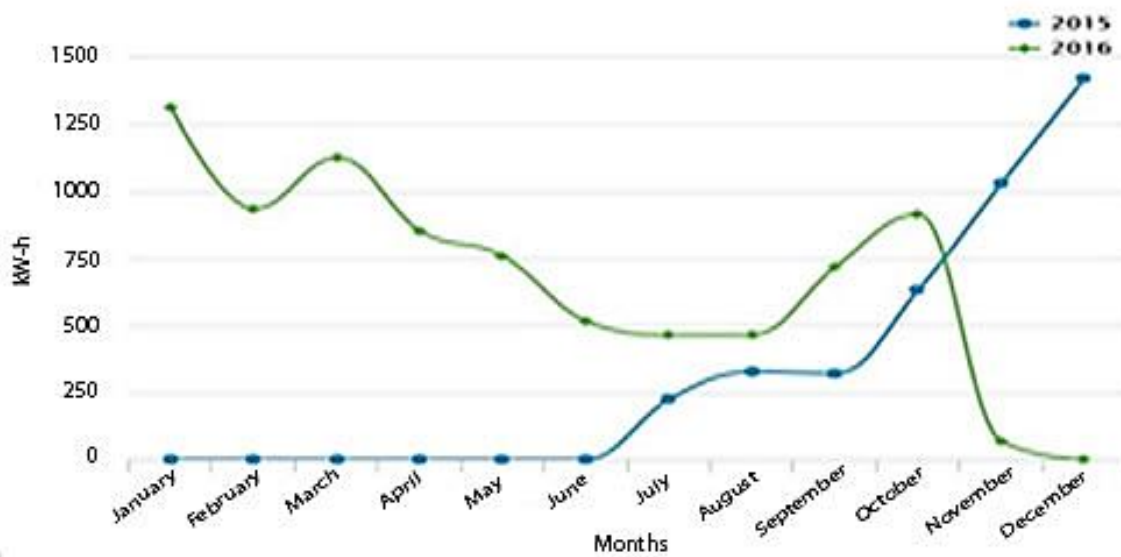
Figure 3: Total Consumption Amount by Months for 2015-2016

As seen in Figure 3, the consumption rate of the Incekaralar Elementary School, which is included in the monitoring system as of 07.02.2015 and examined until 11/01/2016, has a minimum consumption of 1480 kWh per month and a minimum of 240 kWh.

Table 1. Max-Min Energy Consumption Amounts of Ince Karalar Elementary School by Month

Months	Max. Energy Consumption (kWh)	Min. Energy Consumption (kWh)
July 2015	19.04	2.04
August 2015	18.159	2.45
September 2015	16.178	5.945
October 2015	44.874	8.24
November 2015	62.774	10.895
December 2015	78.84	19.95
January 2016	67.457	16.595
February 2016	52.52	11.56
March 2016	65.950	3.425
April 2016	84.973	8.958
May 2016	40.924	8.124
June 2016	27.24	12.654
July 2016	15.0	15.0
August 2016	15.0	15.0
September 2016	27.65	12.654
October 2016	42.824	27.534

Graphs related to academic calendar of 2015-2016 academic year were obtained for application of DSM strategies in 2-semester education system applied in MNE. Periods; I. Period October to February, Intermediate February, II. The period covers from March to July, summer vacation from July to October.

Table 2. Max - Min Energy Consumption Quantities of İncekaralar Elementary School by Periods

Periods	Max. Energy Consumption (kWh)	Min. Energy Consumption (kWh)
First semester	78.28	8.24
Break holiday	52.52	11.56
Second semester	65.950	3.425
Summer holiday	27.65	15.0
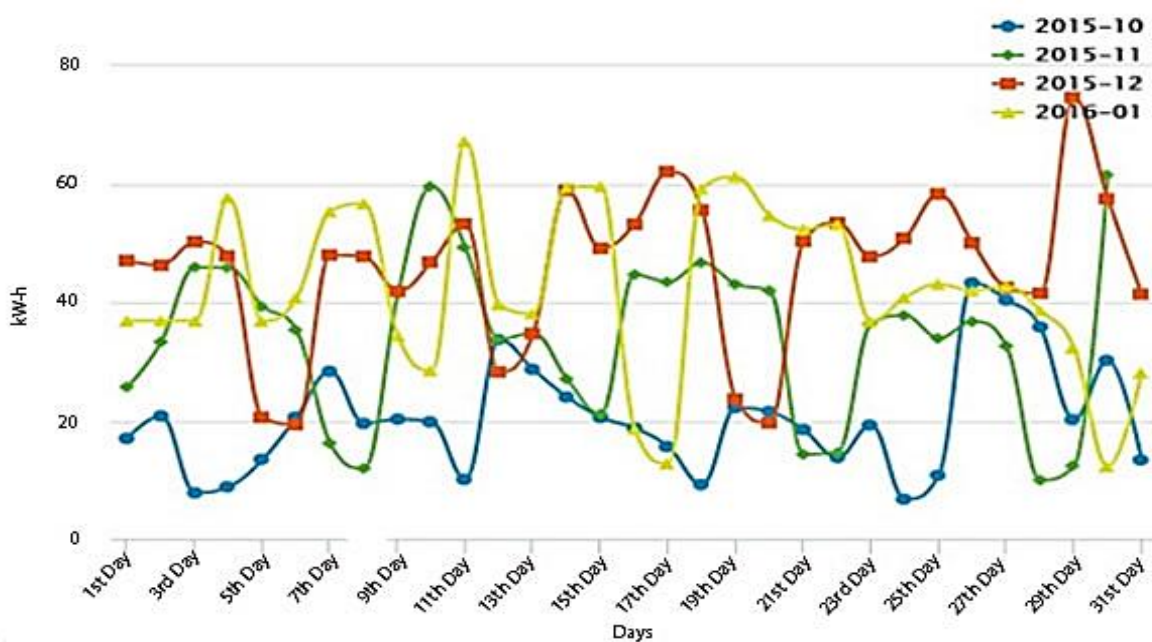
Figure 4: First Period Total Consumption Amount

As can be seen in Figure 4, the consumption amount is 78.28 kWh maximum and 8.24 kWh minimum according to the First Period days.
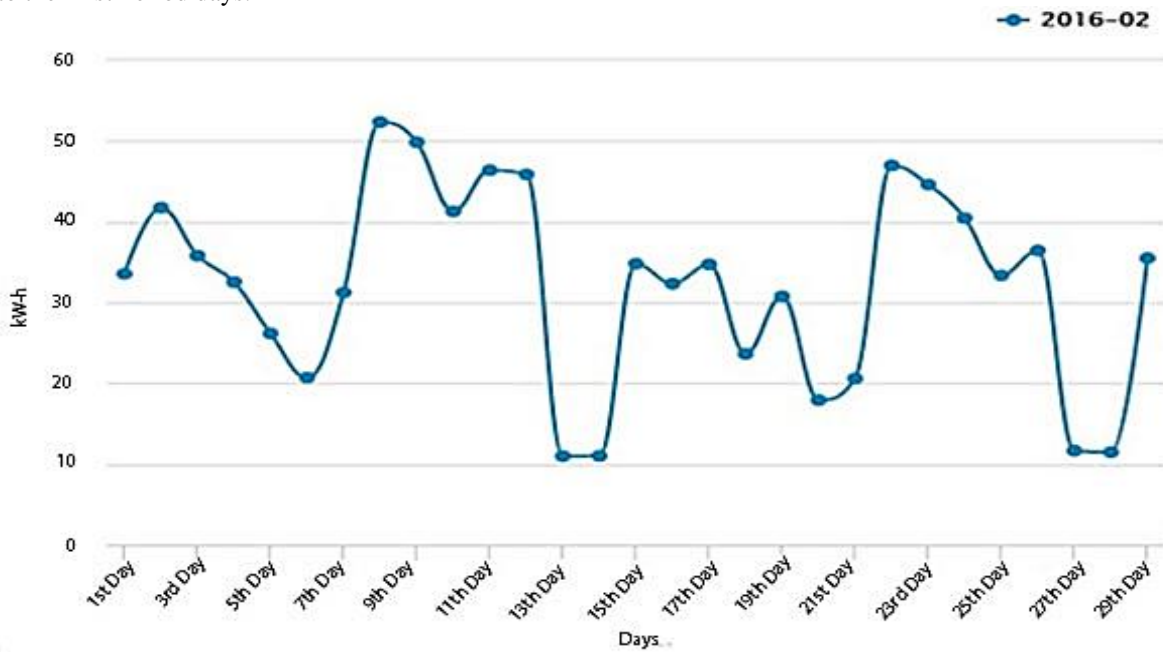
Figure 5. Semester Holiday Total Consumption Amount

In Figure 5, during the break-in period covering February, the consumption per day is maximum 53.056 kWh - minimum 16.988 kWh.
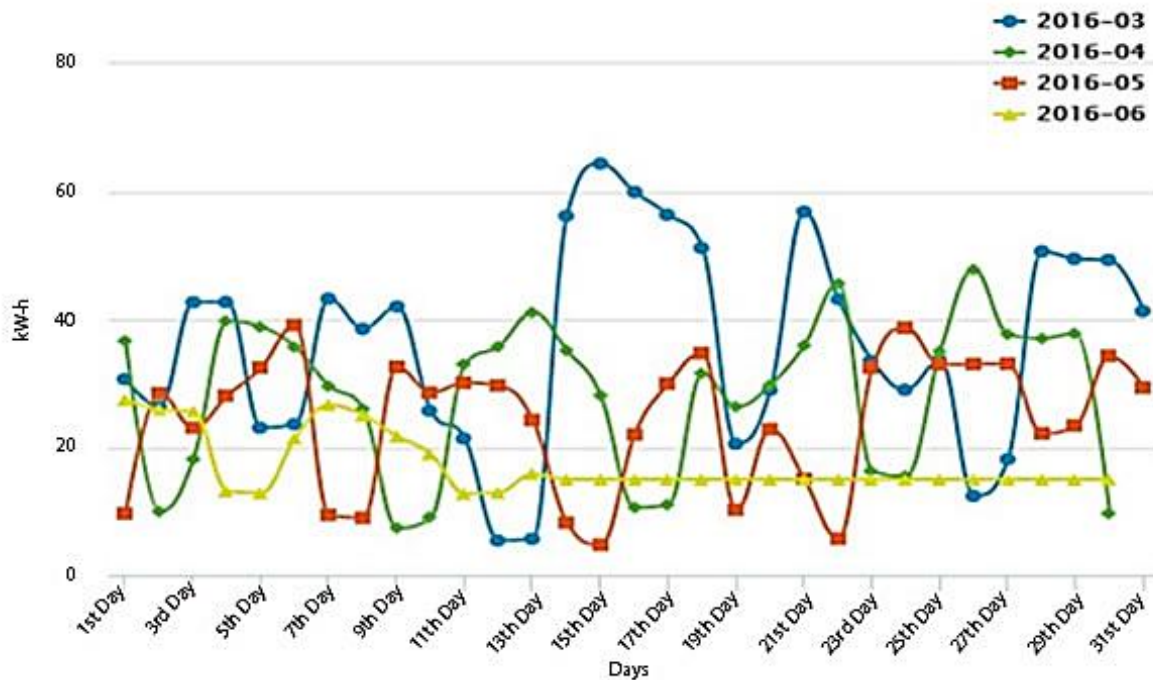
Figure 6. Second Period Total Consumption Amount.

In Figure 6, Consumption in the period covering March-June months is a maximum of 65,950 kWh and a minimum of 3,425 kWh per day.
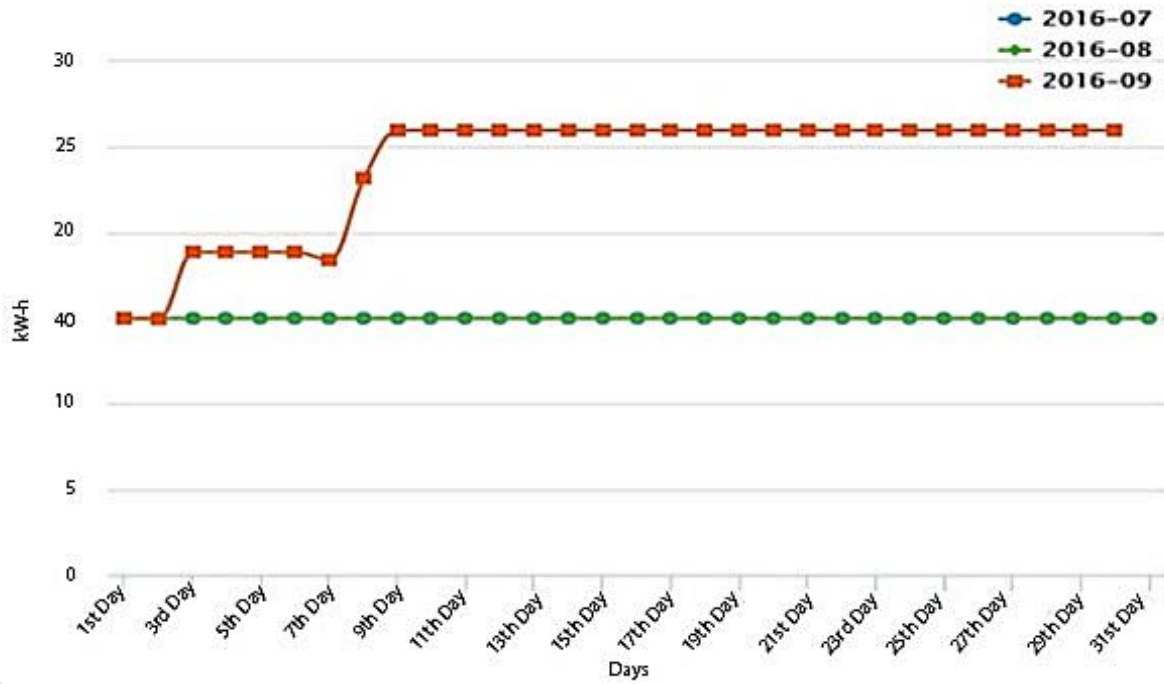
Figure 7. Summer Vacation Total Consumption Amount.

In Figure 7, Consumption in the period covering the period July to September is maximum 27,658 kWh and minimum 15,012 kWh.
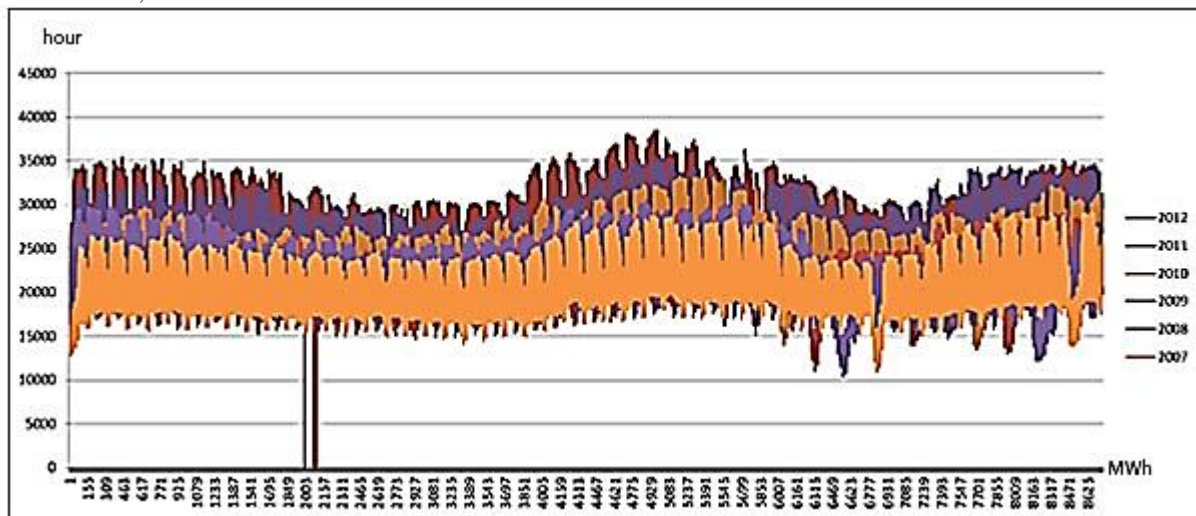
Figure 8: Turkey's load curve between 2007 and 2012.

In the graph in Figure 8, there are data obtained from National Load Dispatch Center obtained between 2007-2012. According to this, the months of high power consumption and the months of low power consumption are determined on a monthly basis. National Load Dispatch "and the energy consumption amounts according to the year 2007 are given in Table 2. This is seen as the summer months when the highest energy consumption was due to the use of cooling systems in June, July, August and September. Since the month of the maximum month is July, this month is set as a holiday this month using the puant request reduction method in DSM methods. Also, since the consumption amounts of the January and February months are lower, these months are determined as the education period. The DSM method applied for these months is the load scrolling method. The yearly / monthly energy consumption curves and the annual energy consumption curve of Turkey were used for the pilot scrolling method in the pilot study. Which of these two graphs should be vacated during the peak days is determined by the common peak times of the energies in the two graphs. The training periods of these months are reported as the energy usage of the two graphs in common. The 3-semester academic calendar recommended under the DSM

application is given in Table 2. The proposed new academic calendar reduces the peak time from the DSM methods in the load curves of the Pilot of İnce Karalar İmam Orator Middle School and provides strategic growth when energy use is little used. Thus it is thought that İnce Karalar will contribute to reducing the fluctuation in the annual / monthly load curves of Imam Orator Middle School. Monthly / annual active consumption curves of Imam Orator Middle School were used in the study. It is thought that the consumption amounts of 26522 schools in Turkey are close to each other. It is foreseen that the fluctuation in Turkey's annual load curve can be somewhat corrected by switching to the new academic-supported education system recommended for all 26522 schools connected to MNE.

In order to decide on the use of the DSM methods, it is firstly decided whether the total load can be reduced for the months by looking at the graphical values of the lighting load curves examined. The calculations made for a single school that is desired to be reached here can be expanded and the whole Turkey curriculum can be corrected. Air conditioning and heating loads must not be included in the calculation to avoid fluctuations in the load charts Calculations in October are considered to be lighting values, and in the load graphs obtained over the following months, only the lighting loads are roughly divided. Here are the minimum load curves for these months since August and July are holidays.

When the method is determined for the results obtained;
Pnew(i)=Pold(i) ----------DSM It had been not apply.
Pnew(i)≥Pold(i) ---------- Puant demand Reduction, Demand Saving, or Load scrolling Fill methods were used.
Pnew(i)≤Pold(i) ---------- Low demand Growth, Strategic Demand Growth methods were used.
The academic calendar prepared in the direction of the suggestions is given in Table 3 and Table 4 on which sub-method of DSM can be applied in which months.

Table 3: Recommended academic calendar.

Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
522871	539964	530222	517898	506032	586828	599076	592538	583873	511105	577964	588513
		Vac				Vac				Vac	
1.term	1.term		2.term	2.term	2.term		3.term	3.term	3.term		1.term

Puant demand reduction, Fill low demand times and Load scrolling are applied from DSM methods.

Table 4 : DSM Methods according to the months.

MONTHS	DSM METHOD
September	Load Scrolling- Filling Low Demand Times
October	Load Scrolling - Decreasing Peak(Puant) Demand
November	Load Scrolling
December	Load Scrolling - Decreasing Peak(Puant) Demand
January	Load Scrolling - Decreasing Peak(Puant) Demand
February	Load Scrolling - Filling Low Demand Times
March	Load Scrolling
April	Load Scrolling - Decreasing Peak(Puant) Demand
May	Load Scrolling - Decreasing Peak(Puant) Demand
June	Load Scrolling - Decreasing Peak(Puant) Demand
July	--
August	Load Scrolling - Filling Low Demand Times

The important factor in the selection of methods is to reduce the fluctuation amount of Turkey's annual load curve with the National Education Academic Calendar which is applied in Turkey today.

• In the academic calendar, there is no holiday in the July recommended calendar, so no DSM Method is applied in this range.

• In April, May, June, October, December and January, which is the course period in the academic calendar and determined as the lecture period in the proposed calendar, it is aimed to decrease the consumption amounts in order to save savings.

• It is aimed to fill the low demand times since August and February which are holidays in the academic calendar are the course period in the proposed schedule.

• However, because the first 2 weeks of September are determined as the lecture period in the recomended calendar since the second 2 weeks is the academic period according to academic reinforcement, the method of applying the low demand times is determined as the method.

DSM applications have a relationship with tariffs. Here, the aim is to save money, as well as to minimize the cost of the consumer. This can be achieved by controlling the peak value. There are two ways to keep the peak value under control. The first balances the distribution within the same group and the second shifts the usage capacity between different groups of subscribers. Because the system operator always has to meet the demand point with the capacity in the system. For this reason, it is possible to create tariff structures using DSM methods for systems where requests are not distributed properly. These tariffs consist of four main components: energy cost, demand cost, subscription cost and counter cost. But in tares, six are separated among themselves; Fixed tariff, block tariff, step tariff, usage time tariff, unmeasured tariff and load factor (Öğünlü, 2006). These tariffs are explained below in order.Fixed tariff; Is calculated by multiplying the amount of energy consumed by the energy cost per unit, in accordance with the result obtained.

The main reason for this constant invoice type is that the cost per unit of energy in each case is constant. Block tariff; This tariff, which has two types, lists increasing block tariffs and decreasing blocks. As the amount of energy consumed or demanded increases, the unit cost of energy is increasing. On the other hand, in the decreasing block

recipe, the unit cost of the energy decreases as the demanded quantity increases. Step schedule; Whatever the total consumed energy, when all consumption exceeds a certain level, the unit energy cost is recalculated. The difference of this equation from the block definition reflects the unit price given after a certain threshold value of consumption to all units. Usage time specification: The unit price varies according to the time consumed. Puant time is also less in demand than unit cost of consumed energy is different from unit cost of energy in the period. Unmetered tariff; It is reflected on the invoice without measuring according to the installed power of the subscriber. It is usually applied to consumption groups such as street lamps that use fixed capacity. Load factor order; The maximum demand amount, the capacity factor, the maximum capacity of the unit price, and the unit energy cost per unit capacity.

These tariffs can be thought of as sub-units of savings and incentive programs used to provide flexibility in invoicing. The management of these programs; Direct load control and indirect load control (Talukdar, 1984).
In direct load control programs, the subscriber's instantaneous control of the request and, if a certain value has been exceeded, allows the subscriber to load with the required signal. Indirect load control programs are the means by which the subscriber's request is adjusted. This does not interfere with the load of the subscriber, the subscriber may go to the load of his choice.

DSM is grouping these controls. These are the main dwelling places. Usage timetable, price quotation and reimbursement schedule and direct load control are applied in the dwellings. Direct load controls are mostly applied on water heaters, residential air conditioners, pool water pumps, storage heating devices. The second group is related to commercial enterprises and industrial enterprises. In this group, cut-off energy, diminutive load, real-time pricing, price quotation and reimbursement are applied.

According to this information, Table 5 provides the tariffs that can be used when the tariffs of DSM methods proposed in Table 3 and Table 4 are combined.

Table 5: Usable tariffs according to the months.

Months	Use-time tariff
September	Use-time tariff
October	Decreasing block tariff
November	Fixed Tariff
December	Decreasing block tariff
January	Decreasing block tariff
February	Use-time tariff
March	Fixed Tariff
April	Decreasing block tariff
May	Decreasing block tariff
June	Decreasing block tariff
July	Fixed Tariff
August	Use-time tariff

In Figure 9, below, the Energy Consumption Graph for the İnce Karalar Schools and the recommended energy consumption for the academic calendar are given.
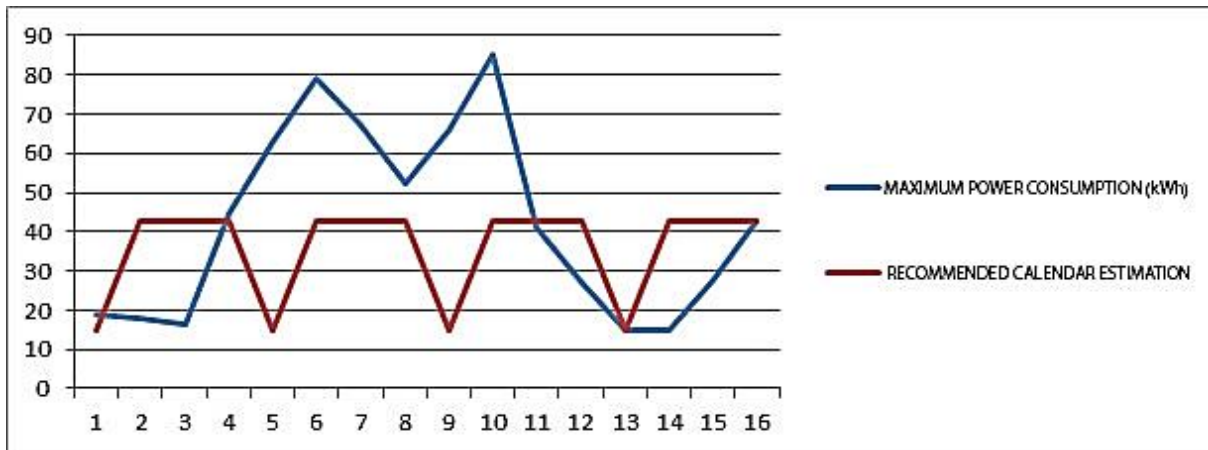
Figure 9: Old Academic Calendar Energy Amount and Suggested Calendar Energy Comparison

At present, when the applied academic calendar graph subfield is calculated, A1 = 344848 kWh. When calculating the area for the proposed calendar, it is calculated as A2 = 230308 kWh. According to the results obtained, the saving amount was calculated as 114466 kWh. 33,19% energy saving is achieved. Budget saving for the school is 472055,22.

Conclusion

In this study, the effect of the DSM and schools on the burden curves of the countries, which are regulated by the MNE, is examined. In addition, a new academic calendar is proposed by going out of there. It is recommended that the 2-semester education system applied in MNE, the interim holidays and the summer vacation periods are changed. Thus, it is foreseen that the DSM Administration, which will be implemented by the Ministry of National Education throughout Turkey, can be prevented from fluctuations in the Turkey freight curriculum in Figure 8. The education curriculum of MNE which can be recommended for this purpose consists of 3 semesters considering the annual load curve. Training periods I. Period December, January, February; II. Period April, May, June; III. Period August, September, October months; March, July, November were offered as holiday months. It is thought that the application of 3 periods in education can greatly correct the annual load curve. In order to correct this trend, peak demand reduction and load scrolling methods were used effectively.

For the demand saving method from DSM methods, the lamp types which are saving from the lighting equipments are calculated and suggested. The other DSM methods used in the study are the methods of filling in peak demand reduction time, filling in low demand times and scrolling the load, including a new academic calendar proposal. The proposed academic calendar was formed by the holidays for the appropriate peak periods in Turkey's annual energy consumption chart and the placement of training periods for the periods with the least amount of energy consumed. It has been determined that energy saving is 33.19% between the current academic calendar and the proposed academic calendar. While this result is the savings that can be obtained from a single school, it is thought that the fluctuation in the Turkey freight curriculum can be reduced when considering Turkey general. In addition to correcting the load curves, lower energy levels can be achieved with appropriate tariff methods.

It is envisaged that 26522 schools in Turkey as of 2015-2016 academic year and approximately the energy consumption amounts of each school are thought to be close to each other and that the DSM and Turkey will contribute to the improvement of the fluctuation that occurs in the curriculum.

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ABBREVIATIONS

MNE	: The Ministry of National Education
TL	: Turkish Lira
DSM	: Demandside Management
Vac	: Holiday (Vacation)
SR	: Saving rate
P	: Power
E	: Energy
Max.	: Maximum
Min.	: Minimum

EDMODO PLATFORM INTEGRATION CHALLENGES ON SECONDARY EDUCATION IN KOSOVO: EMPIRICAL ANALYSIS

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Abstract: The idea behind this paper starts from the strategic plan for education in Kosovo, where a key priority for the Ministry of Education and Science is the integration of ICT and other education tools in teaching and learning process in secondary education. Contemporary education systems are using different learning platforms to accomplish their tasks effectively and provide easy access to different learning resources. It has been more than a decade since the Learning Management Systems are introduced, and it seems to become one of the most important platforms for increasing the value of learning and teaching process in Kosovo. The paper shares the experience on the use of Edmodo LMS as a tool for enhancing the quality of learning and teaching. It addresses the perceived usefulness and challenges regarding Edmodo as a tool for enhancing students' learning. Edmodo is a free and secure educational learning platform, which provides a simple way for teachers to create and manage an online classroom community. It allows teachers to connect and work with their students anywhere and anytime. Seeing the importance of using a learning platform, we have conducted a survey, which relies upon collection of empirical data with an aim to explore the impact and importance and the challenges of using it in secondary education in Kosovo. In addition, the importance of this study was to study the factors affecting the effective adoption of LMS by the schools staff and to propose solutions to help improve future adoption.

Keywords: Edmodo Platform, Secondary Education, Kosovo

Introduction

School infrastructure is a key factor for effective teaching and learning in schools, in order to increase school attendance of students and improve their achievements but also to increase staff motivation as well. School infrastructure includes classrooms, laboratories, etc. and the day-to-day-formal teaching and learning traditionally takes place in the classrooms.

Information and communication technologies (ICTs) have changed the nature of global interactions and educational practices and it has been adopted almost everywhere. Intensively is being used in educational institutions as well (Drent, M & Meelissen, M), and affects all educational stakeholders: educators, parents, and students. The current generation of ICT development, known as a learning management system (LMS), is designed to organize and regulate the administrative tasks of schools and other organizations (Esther, S). LMS referred as Virtual Learning Environments, Course Management Systems, etc., is web based application, running on a server and accessible with a web browser from any location with an Internet connection. LMS originated in the late nineties of the previous century. Its adoption rate is higher in higher education. LMSs' are being used in secondary education as well, but little is known about the technology acceptance of LMS; how it influences on learning; how the use of LMS is related with teachers' and students' perceptions about teaching and learning; learning outcomes resulting from the use of an LMS, and about teachers' motivation and training for using the LMS. There are two groups of LMSs, commercial and free and online LMSs. Commercial LMSs like Blackboard, often has practical constraints, for example, it tend to be expensive and not every school can afford to purchase and maintain them over the long run. Trainee teachers cannot access certain features such as creating a course, enrolling students and setting up student groups as these functions are usually open to instructors or administrators only. Edmodo as free online LMS is promoted as a 'secure social networking environment' whose interface resembles Facebook, which makes it instantly popular with students! A single teacher to help maintain daily activities of the class, with no technical expertise required to get started, can implement Edmodo. A teacher can create Groups, which might be based on class structure, curriculum groups, etc. Unlimited number of documents can be stored in Edmodo Library and these documents can be shared within Groups using folders. Edmodo integrates with Google Docs –in the Google Drive folder directly from your Edmodo Library and make files in your Google Drive folder available in your shared folders. Edmodo can be personalized with a unique subdomain for your school, and a unique personal profile address.

This study aimed to identify the use of Edomodo, its impact in quality of learning and the challenges the staff is facing while trying to use it. The literature suggests that teacher commitment and infrastructure are driving forces behind LMS use, if the technology is available, but it does not identify how teachers are motivated to use LMSs. Usually governments do not provide any incentives to schools for implementing LMSs. In order to gain a deeper understanding of what factors influence the teachers' use of Edmodo, the mixed-method research is addressed. The questionnaire, that incorporates closed and open-ended questions, was the main data gathering technique and the semi-structured interviews with the teaching staff, which has offered more in depth data comparing to the questionnaire, which tend to be superficial. The paper is composed as following. The first part chapter is an introduction to the subject, the second elaborates the research approach, the third and the forth chapters presents the research questions and empirical results respectively, while the last one is the conclusion section.

The Research Approach

Learning benefits of ICTs are widely recognized by academics and practitioners alike, but the context in which teachers operate often affects the extent to which ICTs are used in order to achieve beneficial teaching & learning outcomes. While ICT is heavily used in school administration, its use in teaching & learning varies significantly. Investigating the use of ICT for teaching & learning can be difficult, as ICT is not a single variable: rather, the effect depends on many other factors, such as what technology is being used, its purpose, and the context in which it is used.

The current generation of ICT development, known as a learning management system (LMS), is designed to organize and regulate the administrative tasks of schools and other organizations (Esther, S). The purpose of the study reported in this paper was to explore what factors affected teachers' use and perception of ICTs, and the use of a new learning management system.

Teaching and administrative staff of five secondary schools responded to a survey. The questionnaire used in this study examines the factors such as teachers-perceived barriers, their knowledge and skills and the ICT infrastructure available. The questionnaire was sent electronically. To add more data on to the case study and complement a survey, we decided to conduct interviews as a second data collection technique. This study included a semi-structured interview, with guiding questions developed ahead. The initial analysis of the survey results influenced interview questions, in particular the questions about faculty-level ICT use.

Outcomes from the study are in the form of recommendations, which we hope to assist the ongoing implementation of a learning management system and the integration of technology in learning environments.

Quantitative data will be analyzed using Statistical Package for the Social Sciences (SPSS) whereas qualitative data will be analyzed with the inductive method. As regarding the sampling frame and size of our survey, the data presented in this paper are answers taken from 200 teacher and school administrators.

Research Questions and Results

Below are presented research questions of our survey.

✓ RQ1. What kind of training do teachers have on applying the learning management platforms?

Answers to questions Q1 (Do you think that the education degree should be taken into the consideration?), Q2 (Do you feel that you are ready to apply this platform?) and Q3 (Does the use of this platform incite curiosity in the educational process) gave us information about our first research question. From the answers, we can conclude that most of the teachers agree that professional training must exist in order to adequately use the online platform. A worrying fact is that 60% of them said they do not feel ready to apply this platform, and 70% of teachers stated that the use of Edmodo platform stimulates curiosity in the teaching process. In addition nonprofessional preparation and the reluctance of teachers are factors that the platform is not being used widely in the school, even though the fact that 70% of teachers stated that the use of Edmodo platform stimulates curiosity in the teaching process. Tables (1,2 and 3) relevant to these questions are presented below.

Table 1: RQ1:Q1

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	Higher education, bachelor	80	42.9	40.0	100.0
	Other	120	57.1	60.0	
	Total	200	100.0	100.0	

Table 2: RQ1:Q2

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	Yes	120	61.9	40.0	100.0
	No	80	38.1	60.0	
	Total	200	100.0	100.0	

Table 3: RQ1:Q3

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	Yes	140	66.7	70.0	100.0
	No	60	28.6	30.0	
	Total	200	100.0	100.0	

✓ RQ2. Dos the current technological infrastructure has any impact and/or supports to effectively use Edmodo?

School infrastructure is a key base for effective use of a learning platform. The answers to Q1: Does school has the IT equipment that support the platform being used? Shows that 85% of teachers fully or partially agree that schools currently are not equipped to support the use the platform.   Q2 (Do you think that applying this platform will improve your teaching?) and Q3 (Do you feel that a learning platform is an important factor towards increasing the quality of learning?) gave us information about the importance and the impact that the use of an LMS has in the teaching process, from their viewpoint. Reports that come from different surveys shows that the use of any learning platform in secondary education process have shown very positive impact. 70 % of teachers are positive whereas 30% of teachers think that the use of a platform has no significant relevance that affects the improvement of teaching and learning, Answers to question Q3 suggest that most of the teachers, 90% feel positive towards LMS use. Tables (4, 5 and 6) relevant to these questions are presented below.

Table 4: RQ2:Q1

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	Completely agree	120	61.1	60.0	100.0
	Partially agree	30	14.3	15.0	
	Agree	20	9.5	10.0	
	Disagree	30	14.3	15.0	
	Total	200	100.0	100.0	

Table 5: RQ2:Q2

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	Completely agree	40	19.0	20.0	100.0
	Partially agree	50	23.8	25.0	
	Agree	50	23.8	25.0	
	Disagree	60	28.6	30.0	
	Total	200	100.0	100.0	

Table 6: RQ2:Q3

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	Completely agree	70	33.3	35.0	100.0
	Partially agree	80	42.1	40.0	
	Agree	30	14.3	15.0	
	Disagree	20	9.5	10.0	
	Total	200	100.0	100.0	

✓ RQ3. Does the age of teachers has any impact on their ability to effectively use a learning platform?

Answers to questions Q1 (Do you apply any platform in your school?), Q2 (Do you think you are ready to apply this platform?) shows that there is a positive correlation between them thus the success of an LMS implementation in a school depends on commitment from the teachers. If the teachers do not take the time to actively participate in the LMS, the students will most likely avoid using it as well.

Table 7: RQ3: Q1 & Q2

		Do you apply any platform in your school?	*Do you think you are ready to apply this platform?*
		Statistics	
N	Valid NO	200	60%
	Valid YES	0	40%
	Total	100%	100.0

Conclusions

First, although learners from 5 schools were involved, this sample cannot fully satisfy the study on using the LMSs. Second, we did not check for additional background variables, such as previous educational history, prior knowledge, motivation, aspirations, social-economic status, etc.

In this study after consulting 200 teachers from secondary schools, it is observed that despite the fact that schools are using a Learning Management System (LMS), only 10% of the participating teachers actively use it. We can conclude that despite the high adoption level of LMS within schools, the low adoption rate of it suggests that teachers are unfamiliar with how LMSs are designed and works.

Other research suggests the most cited barrier to successful ICT use and integration is a lack of teachers' professional development. Our survey shows that most of the teachers do not feel confident toward use of ICT and consider themselves as having limited knowledge to make fully use or integrate ICTs into teaching and rely on the ICT coordinator's support.

While the future for the LMS may sound promising, research shows that the use of LMS depends on teachers' motivation and training for using the system. The findings show that teachers did not attend any LMS training courses. Most of the participant were unaware of the LMS provided by their schools, which indicates that schools do not enforce staff toward using them.

In order to enhance the teachers' awareness towards LMS usage, we suggest that schools should provide their staff with the technology and training courses. Online training for example could have several benefits such as teachers will access it without leaving their classrooms, they can improve their computer literacy and be able to interact with their trainers and colleagues.

We believe that the use of Edmodo platform will positively affect students learning by positively stimulating them with different tasks and activities. In addition, teachers' mechanical work will be reduced, their collaboration with students will be tightened and it will increase the value of learning and teaching.

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ENVIRONMENTAL-MAFIA. THE ROLE OF LITERATURE IN EDUCATION IN ENVIRONMENTAL EDUCATION PROJECTS

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Abstract: The judicial systems of many countries contemplate the notion of "environmental crime". A crime always involves suffering; then, through the notion of environmental crime, the law recognizes the existence of a pain inflicted to the entire Earth. A narrative focused on "Environmental Crimes" allows readers to experience (virtually) this "pain of the planet." The purpose of this intervention is to illustrate how the thriller, thanks to the identification mechanisms, may contribute to the formation of an "environmental consciousness" able to feel empathically the planet's pain and prevent it. In other words, it is assumed that fiction can play an important role in environmental education projects.

Keywords: environmental education, fiction, .

Introduction

My aim is to analyze the role of literary fiction in the definition of massive environmental sensitivity. To explain the problem I'll start from a text by one of the most famous contemporary Italian writers: Roberto Saviano. In his non-fiction novel, *Gomorrah*, Saviano illustrated the tremendous power of the economic empire of the Neapolitan Mafia, the Camorra, and for this reason he was sentenced to death by the mafia itself. In the last chapter of the book, he speaks of the "Land of Fires", of the territory where, through criminal organizations, thousands of tonnes of toxic or polluting waste are illegally disposed of. The following passage clarifies many aspects of this business, but also tells us something about social attitudes that make it possible:

> The image of a landfill, pit, or quarry is increasingly a concrete and visible synonym for deadly danger for nearby residents. The Giugliano-Villaricca- Qualiano triangle near Naples has come to be known as the Land of Fires. Thirtynine landfills, twenty-seven of which contain hazardous waste. An area with a 30 percent annual increase in landfills. When a site approaches capacity, the trash is set on fire. A tried and true method. Gypsy boys are the best at it. The clans give them 50 euros for each mound burned. The technique is simple. They circumscribe each hill with videocassette tapes, pour alcohol and gas all over it, twist the tape ends to form an enormous fuse, then move away, putting a cigarette lighter to the fuse. In a few seconds there's a forest of flames, as if they'd launched napalm bombs. They throw foundry remnants, glue, and naphtha dregs into the fire. Dense black smoke and flames contaminate every inch of land with dioxins. The local agriculture, which used to export fruit and vegetables as far as Scandinavia, is collapsing. Plants sprout diseased, and the land grows infertile. But this disaster and the farmers' rage are only the umpteenth advantage for the Camorra: desperate landowners sell off their fields, and the clans acquire new landfill sites at low— very low—costs. Meanwhile people are constantly dying of tumors.(Saviano 2008: 223)

What Saviano tells is not an absolute novelty, it is not a discovery. The " Land of Fires " is inhabited by two million people, and the mountains of garbage is plain to all: the strength of Saviano's book is not in the choice of the facts, but in the power of the word that denounces. To denounce is to make known who ought to have a fact that otherwise would be hidden, but in Italian literary practice, denouncing means, more often than not, to turn into a story not what is concealed but what has been circulating for a long time in the vox populi, as if the reality, to be really such, needs a sort of literary consecration.

«The world was so recent – writes Garcia Marquez in *One hundred years of solitude* - that many things lacked names, and in order to indicate them it was necessary to point». So, the literature of denunciation has this function, that of providing a vocabulary to reality. Literature does not disclose the world of environmental disasters, but it does make this world within us not only in a rational but emotional way: literature, through the mechanism of imitation, forces us

to suffer together with the planet who suffers and this suffering is the starting point for any environmental education project. To make this statement clearer, we read again a passage from Saviano:

> The bosses have had no qualms about saturating their towns with toxins and letting the lands that surround their estates go bad. The life of a boss is short; the power of a clan, between vendettas, arrests, killings, and life sentences, cannot last for long. To flood an area with toxic waste and circle one's city with poisonous mountain ranges is a problem only for someone with a sense of social responsibility and a long-term concept of power. (Saviano 2008: 214)

> I once decided to cross the Land of Fires on foot. I tied a handkerchief over my mouth and nose, the way the Gypsy boys do when they set fires. We looked like a gang of cowboys in a desert of burned garbage. I walked through lands devoured by dioxins, dumped on by trucks, and so gutted by fire that the holes would never completely be erased. The smoke around me wasn't dense, but more like a sticky patina on the skin, making me feel damp. Not far from the fires was a series of houses, each one sitting on an enormous X of reinforced concrete. Homes resting on closed landfills and unauthorized dumps, their potential exhausted now that they'd been filled to the point of exploding and everything combustible had been burned. Yet the clans managed to reconvert them to building zones. After all, officially they were pasture and farmlands. And so they built charming clusters of small villas. The terrain was unstable, however; landslides could occur and chasms suddenly open, so a fretwork of reinforced concrete propped up the dwellings, securing them. The houses were affordable. Everyone knew they were standing on tons of trash, but given the chance to own their own home, office clerks, factory workers, and retirees don't look a gift horse in the mouth. (Saviano 2008: 224)

These words make us realize that the first obstacle to the path of environmental education is the failure to acknowledge the danger. So are the bosses of the mafia who scatter poisons in their own land, as ordinary citizens who build their homes on that land, place the times of ecological apocalypse, but also the shorter ones of the inexorable decline of a circumscribed territory, outside of the temporal horizon of their lives; they are convinced that the consequences of their acts will not concern them, nor their children, and even think that so far distant consequences are not even related to their gestures and that maybe in the meantime someone will find the way to clean where they are got dirty.

 The first idea to be fought in a process of environmental empowerment is the idea that the environment is not a part of our life, which is something strange to it. Literary imitation works in the opposite direction, bringing within our lives and our experience something that does not belong to us. If we read the Odyssey, The sufferings of a Greek warrior thousands of years ago become our sufferings: we are anxious for him, we wonder if he will ever return to Ithaca, We wonder if he will ever return to Ithaca, if he will ever embrace Penelope again, and if, after returning home, he will be able to defeat the Proces that occupy the palace and make an attempt on the bride's virtue. We do not have the same emotional attitude when we read a book of Greek history; rational thought allows us to understand the lives of men who lived in such a great distance in time and space, but it is the emotional intelligence that makes us grasp Ulysses' modernity, which makes us understand that Ulysses are us. Likewise, we can read dozens of essays on the dramatic situation of pollution, but only when the environment becomes a character of a story we feel its closeness to our existence: the empathic power of fiction is even stronger than reality and physical proximity.
Siri Hustvedt says:

> Fictions are born of the same faculty that transmutes experience into the narratives we remember explicitly but which are formed unconsciously. Like episodic memories and dreams, fiction reinvents deeply emotional material into meaningful stories, even though in the novel, characters and plots are not necessarily anchored in actual events. And we do not have to be Cartesian dualists to think of imagination as a bridge between a timeless core sensorimotor affective self and the fully self-conscious, reasoning, and/or narrating linguistic cultural self, rooted in the subjective–intersubjective realities of time and space. Writing fiction, creating an imaginary world, is, it seems, rather like remembering what never happened. (Hustved 2011: 195)

Fiction as "Futur studies"

As we have seen, the first element necessary for environmental education is the projection to a future that is not our individual future, but the future of a society, if not the future of all humanity. In other words, to be truly aware of environmental damage, we must look beyond the horizon of the next two generations and to do so we must use the tools of imagination, fiction or, to say, science fiction. From its origins, science fiction has divided literary criticism into two distinct factions: those who believed it a literary genre of pure entertainment and, ultimately, corruption of reality; and those who argued that the "literature of anticipation" had the ability to warn against dangers to appear in the future but generated by attitudes of the present. The latter preferred, within science fiction, a very important sub-genre that today we generally call "dystopia".

> Dystopia is an imagined place or state in which everything is unpleasant or bad, typically a totalitarian or environmentally degraded one.

The opposite of utopia
This is the definition of Dystopia offered by the Oxford dictionary.

A good example of political dystopia has been offered by Orwell's *1984*, while the end-millennium environmental dystopian imagery is surely marked by the movie *The Matrix*. The function of dystopian fiction is, for our society, very similar to that of some texts of teleological content and, in particular, is very similar to the function that has, in Christian context, the Apocalypse of St. John: the dystopia, like the Book of Revelation, are threats and warnings at the same time, they are the image of a future far away from the present time, but whose construction begins in the present or, perhaps it has already begun in the past, a building based on sin, sin against God, for believers, sin against nature, in a materialistic conception. In two thousand years, that is, in the time spent between the editing of the last book of the New Testament and the release of The Matrix, humanity has always needed to adjust its behavior basing on the narrative prefiguration of a world destroyed by evil . This is an anthropological necessity that we can not ignore in the design of environmental education interventions.

Distopian fiction says with great clarity how tomorrow's world will be if we do not modify our environmental behaviors today.And here's how, in 1973, a great Italian writer, Italo Calvino, who had never been to China, imagined the Chinese cities of the future:

> The city of Leonia refashions itself every day: every morning the people wake between fresh sheets, wash with just-unwrapped cakes of soap, wear brand-new clothing, take from the latest model refrigerator still unopened tins, listening to the last-minute jingles from the most up-to-date radio.
>
> On the sidewalks, encased in spotless plastic bags, the remains of yesterday's Leonia await the garbage truck. Not only squeezed rubes of toothpaste, blown-out light bulbs, newspapers, containers, wrappings, but also boilers, encyclopedias, pianos, porcelain dinner services. It is not so much by the things that each day are manufactured, sold, bought that you can measure Leonia's opulence, but rather by the things that each day are thrown out to make room for the new. So you begin to wonder if Leonia's true passion is really, as they say, the enjoyment of new and different things, and not, instead, the joy of expelling, discarding, cleansing itself of a recurrent impurity. The fact is that street cleaners are welcomed like angels, and their task of removing the residue of yesterday's existence is surrounded by a respectful silence, like a ritual that inspires devotion, perhaps only because once things have been cast off nobody wants to have to think about them further.
>
> Nobody wonders where, each day, they carry their load of refuse. Outside the city, surely; but each year the city expands, and the street cleaners have to fall farther back. The bulk of the outflow increases and the piles rise higher, become stratified, extend over a wider perimeter. Besides, the more Leonia's talent for making new materials excels, the more the rubbish improves in quality, resists time, the elements, fermentations, combustions. A fortress of indestructible leftovers surrounds Leonia, dominating it on every side, like a chain of mountains.
>
> This is the result: the more Leonia expels goods, the more it accumulates them; the scales of its past are soldered into a cuirass that cannot be removed. As the city is renewed each day, it preserves all of itself in its only definitive form: yesterday's sweepings piled up on the sweepings of the day before yesterday and of all its days and years and decades.

Leonia's rubbish little by little would invade the world, if, from beyond the final crest of its boundless rubbish heap, the street cleaners of other cities were not pressing, also pushing mountains of refuse in front of themselves. Perhaps the whole world, beyond Leonia's boundaries, is covered by craters of rubbish, each surrounding a metropolis in constant eruption. The boundaries between the alien, hostile cities are infected ramparts where the detritus of both support each other, overlap, mingle.

The greater its height grows, the more the danger of a landslide looms: a tin can, an old tire, an unraveled wine flask, if it rolls toward Leonia, is enough to bring with it an avalanche of unmated shoes, calendars of bygone years, withered flowers, submerging the city in its own past, which it had tried in vain to reject, mingling with the past of the neighboring cities, finally clean. A cataclysm will flatten the sordid mountain range, canceling every trace of the metropolis always dressed in new clothes. In the nearby cities they are all ready, waiting with bulldozers to flatten the terrain, to push into the new territory, expand, and drive the new street cleaners still farther out. (Calvino 2006: 114-166)

Political dystopia and enviromental dystopia: are they differents things?

Speaking about dystopian fiction we have said that it is generally of two types: political and environmental. But are these really two different categories?? What Calvino proposes to us in his *Invisible Cities* is surely an apocalyptic scenario from an environmental point of view, but this scenario is made possible by political choices. Political choices make possible the city-dump of Agbogbloshie, Ghana, or Guiyu in China. At the Agbogbloshie dump there are about 40,000 people, most of whom are young people: they spend their lives in waste, drink polluted water and breathe the smoke of combustion of electrical insulators; the incidence of cancer incidence is infinitely higher than that of any other part of the world. Much like this is the situation in Guiyu, where, as in Agbogbloshie, e-waste accumulates from all over the world: millions of old cathode-ray monitors, millions of motherboards, hard disks, and televisions. The technologically advanced world is the city of Leonia and the forgotten regions are its boundaries. But the risk of environmental education is that these places, these *waste lands*, are perceived as a natural consequence of development, as a simple container waste a bit smelly: it is not pleasant to have it close to home, but by moving it a little farther, it is more than tolerable. To avoid this risk, it is necessary for those who live in advanced areas to realize that much of the polluting waste disposal passes through the power of criminal organizations, through the Mafia. This is the true political dystopia: an international totalitarian governed by the mafias. And unfortunately this is not a dystopia, it is not political fiction, but a simple reality, albeit a little hidden.

Roberto Saviano writes:

There are two types of waste producers: those whose only objective is to save on price and who have no concern for the trustworthiness of the removal companies, considering their responsibility complete as soon as the poison leale their premises; and those directly implicated in the operations, who illegally dispose of the waste themselves. (Saviano 2008: 218)

Saviano refers to industrial waste producers, but all of us, as members of a consumer society, are waste producers, doing environmental education means creating citizens who do not belong to any of the two categories, means creating citizens interested in understanding where they end up the computers, the smartphones, the paint or the tires that we no longer use, the citizens who are not content to place the waste container away from their nose. We need to make citizens aware of the fact that waste constitutes for criminal organizations a much larger business than the drug. And this is where criminal fiction can help educational processes, showing, with all the strength that narrative has, what mechanisms are governing the illegal trade of hazardous waste and what are the consequences of this trade for the planet and for other human beings.

The judicial systems of many countries contemplate the notion of "environmental crime". A crime always involves suffering; then, through the notion of environmental crime, the law recognizes the existence of a pain inflicted to the entire Earth. A narrative focused on "Environmental Crimes" allows readers to experience (virtually) this "pain of the planet." It is therefore necessary to give space to a thriller sub-genre who expressly speaks of environmental crimes. In various parts of the world are emerging editorial series completely dedicated to crime story stories and these topics were dealt with important writers such as Italian Carlo Lucarelli,(2008) US Carl Hiaasen (1986) or German Frank Schätzing (2011), but there is still no serious commitment from of television producers. Television series are perhaps the most powerful "narrative education" tool we have today; as demonstrated by studies on Miguel Sabido's educational soap opera (Lozano & Singhal 1993; Nariman 1993) and those on the use of a crime series such as CSI in health prevention; it is therefore necessary for the cultural industry to promote fiction productions focusing on the fight against the environmental mafia: of course it will not be fiction to solve the waste problem, but its role will be to create a new environmental consciousness on viewers, and this is already very much.

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FACIAL EXPRESSION RECOGNITION WITH ROBUST FEATURE SELECTION

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Abstract: Facial expressions are an important part of human-machine interaction as well as playing a substantial role in human communication. Since facial expressions are significant parameters in decision making on such important issues as criminal detection, monitoring the attention of the driver and patient follow-up, automatic detection of facial expressions via systems has become a popular subject. In this study, the detection of facial expressions is aimed by selecting the robust features affecting the detection of emotions in facial images. Face++ SDK is used for locating the facial keypoints. All probable distance data between the points and ratio data between the lines have been calculated, then the robust distance, ratio and distance + ratio features affecting the expression detection has been selected by Sequential Forward Selection (SFS) method. Following this step, each robust feature vectors has been classified and their success rates have been compared. For classification, Support Vector Machines (SVM) and k-Nearest Neighbors (KNN) are used. As a result, 91% success rate has been achieved with 4 robust ratio features on SVM. In our study, in which neutral, surprised, sadness, angry, happy facial expressions have been analysed, surprised has been predicted right by 100%, happy and angry by 95%.

Keywords: facial expression recognition, robust feature selection, image analysis, machine learning

Introduction

Human behavior is the basic principle behind communication among people and is also used in human-machine interaction (Shin, 2009). As one of the keystones of inter-human communication, facial expressions reveal different combinations of facial muscles and constitute one of the variations of nonverbal communication (De et al., 2015). Mehrabian underlined that facial expression is more effective in communicating a message than words in face-to-face communication (Mehrabian, 1968). In his study, he revealed that words are 7% effective, voice tone is 38% effective, and body language is 55% effective in communicating a message.

As a noted scientist in psychology, Paul Ekman determined six innate facial expressions as universal. In their study, Ekman and Friesen sought answers to the question of which facial expressions are universal. The results of the study revealed that the emotions of anger, disgust, fear, happiness, sadness, and surprise are observed in the same way among all people (Ekman & Friesen, 1971).

Automatic detection of facial expressions via systems is among the most popular subjects studied today. Facial expression can be used in areas such as the detection of criminals via computers (Stanković et al., 2015), monitoring driver attention (Zhang & Hua, 2015), human-machine interaction (Luo et al., 2015)(Mistry et al., 2014) image understanding (Sonmez & Albayrak, 2016), artificial face animation (Thalmann et al., 1998)(Tu et al., 2004), health (Lo Presti & La Cascia, 2015), computer games (Osone et al., 2010)(Liang et al., 2004)(Zhan et al., 2008), and media (An & Chung, 2009). However, while noise occurring in facial images transferred to digital media (e.g., full or partial concealment of the face by various objects, shade formation, or low resolution) increase the difficulty of this process, ensuring real-time performance further restricts the general process.

Facial expression recognition is generally carried out under three categories (Hsu et al., 2013)(Lin Zhong et al., 2012), namely geometric-based, appearance-based, and action unit- (AU) based analysis. In the geometric-based method, shape information about the face is used. The active shape model (ASM) is an example of the geometric-based approach (Oktay, 2011). For the appearance-based approach, features of the facial tissue come into prominence. Local binary pattern (LBP) (Hung et al., 2006) is an example of this approach. The active appearance model (AAM) (Cootes et al., 1998) method uses both the geometric- and appearance-based approaches. For the AU-based approach, the movements of facial muscles are identified by a system called the Facial Action Coding

System (FACS) (Ekman & Friesen, 1978).

The detection of facial expressions comprises four stages, namely detection of the facial area, preprocessing step, extraction of facial features, and classification of facial expressions. For facial feature extraction, principal component analysis (PCA) (De et al., 2015), (Sonmez & Albayrak, 2016), steerable pyramid decomposition (Mahersia & Hamrouni, 2015), histogram of gradients (HOG) (Ouyang et al., 2015), linear discriminant analysis (LDA) (Sonmez & Albayrak, 2016), LBP (Sonmez & Albayrak, 2016), Gabor filters (Bashyal & Venayagamoorthy, 2008)(Lajevardi & Hussain, 2009), and learning vector quantization (LVQ) (Bashyal & Venayagamoorthy, 2008) have provided successful results. For facial expression classifications, a support vector machine (SVM) is frequently used because of its successful results (Liao et al., 2013)(Sümer, 2014)(Zavaschi et al., 2011)(Valstar et al., 2011)(Bartlett et al., 2005)(Martin et al., 2008)(Littlewort et al., 2011)(Yurtkan & Demirel, 2014)(Zhang et al., 2012)(Zhang et al., 2016)(Ji & Idrissi, 2012).

In this study, the Radboud Facial Expression Database (RaFD) was used. Facial keypoints were detected on the images of the database with Face++ SDK (Face++, 2017). Of the 26 keypoints obtained, the distance to other keypoints and the ratios of these distances were calculated. The obtained distance, ratio, and distance + ratio feature clusters were analyzed by the sequential forward selection (SFS) feature selection algorithm, and strong features affecting the facial expression response were determined. Features were entered in various classifiers, and comparative results are presented in a table. This study contributes to the literature through its analysis of the features obtained from (Zhang et al., 2016)the distances and ratios of facial keypoints and high success rates in the detection of facial expressions with only four features.

The rest of the article is structured as follows. Part 2 explains the proposed method in detail. Part 3 presents the comparative experimental results in tables. Part 4 compiles the results of the study and makes suggestions for future studies.

Proposed Method

In this study, facial keypoints were detected on human face images. The distance between these keypoints and the ratios of these distances were calculated. Based on this distance and ratio data, strong features were obtained using the SFS algorithm. The obtained data were classified by means of the KNN and SVM methods, and facial expressions were detected. A block diagram of the application is shown in Figure 1.
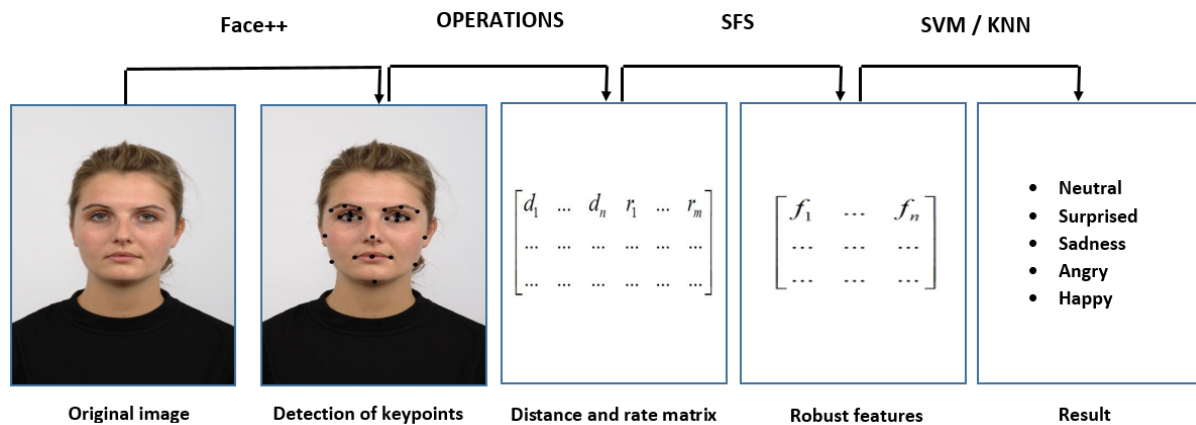
Figure 1. Proposed Method

A.   Feature extraction using facial keypoints

According to psychology studies, facial expressions are formed by changes around the mouth, eyes, and nose (Lin Zhong et al., 2012). In this study, 26 points were determined and these are shown in Table 1.

The Euclidean distance of each point was calculated. The number of distance between each set of two points is calculated according to Equation 1:

$$C(n,r) = \binom{n}{r} = \frac{n!}{r!(n-r)!} \tag{1}$$

n in Equation 1 is the total number of points (*n*=26), and the *r* value is 2 since the distance between each set of two points was calculated. Based on 325 distance data records, ratios of each distance to other distances were calculated. The number of ratio data was calculated as 52650 according to Equation 1. Information on two distances is required for ratio data. For this calculation, *n*=325 and *r*=2. Thus, 325 distance records, 52650 ratio data records, and, as the unified form, 52975 distance + ratio data records were created for each face image in the database. Since this huge number of features would create a processing load in the classification stage, features should be chosen for better detection.

To sort out the data negatively affecting the result, the obtained distance, ratio, and distance + ratio data were subjected to the feature selection process. Instead of working with all the data, the possibility of achieving the same level of success is increased by using less and more meaningful data. With the feature selection process, the load on memory and the processor is reduced. Thus, the SFS algorithm was used in this study.

A ratio and distance matrix and its unified version were analyzed separately by the SFS algorithm. As a result of the analysis, six robust features were selected from the 325 distance data records of each image. The four robust feature data were selected from 52650 ratio data. The 52975 ratio + distance data records were reduced to five features.

Table 1: Facial Keypoints and their Explanation

Facial Keypoints	Point	Explanation
	1	Chin
	2	Left ear level
	3	Left cheek level
	4	Right ear level
	5	Right cheek level
	6	Left under eye
	7	Left eye outer corner
	8	Left pupil
	9	Left eye inner corner
	10	Left over eye
	11	Left eyebrow outer end
	12	Left eyebrow center
	13	Left eyebrow inner end
	14	Mouth left corner
	15	Mouth center bottom lip
	16	Mouth right corner
	17	Mouth center top lip
	18	Nose
	19	Right under eye
	20	Right eye inner corner
	21	Right pupil
	22	Right eye outer corner
	23	Right over eye
	24	Right eyebrow inner end
	25	Right eyebrow center
	26	Right eyebrow outer center

B.   Selection of the robust feature for facial expression recognition

In this study, SFS was used for the robust feature selection. The SFS algorithm was proposed by Whitney (Whitney, 1971). Classification is used in the algorithm. Although its working speed is low, its performance is high because of its capacity to analyze different feature clusters together and evaluate the relationships between features (Kaya, 2014).

The SFS algorithm begins by working with one feature vector from the feature cluster. With the help of a classifier, it scans the features, selects the best feature affecting the result with the first feature, and creates a feature cluster with two elements. Afterwards, the algorithm continues working with the same logic for the selection of a new feature from the feature cluster. This cycle continues until there is no further improvement in the classification process and ends when it reaches the present success limit. Pseudo code of SFS is as follows:

I.   Create an empty set, $F_0 = \{\,\}$

II.   Select a feature for the best result: $Z^t = \arg\max\left[J(F_k + Z)\right] \,\&\, Z^t \notin F_k$

III.   Add Z^1 to the set: $F_{k+1} = F_k + Z^t \,\&\, k{+}{+}$

IV.   Go to II

C.   Classification of the Facial Expression

After the determination of robust features affecting facial expression recognition, these features have to be classified. In this study, SVM (Sümer, 2014),(Beszedes & Culverhouse, 2007) and KNN (Lee et al., 2016)(Cheon & Kim, 2008)classifiers, which produced successful results in the literature, were used for the classification of facial expressions, and the success rates were compared. Since the resulting data will be used in another study on the analysis of attention, the present study was conducted for five emotions. These expressions are neutral, surprised, sad, angry, and happy.

SVM is a classification algorithm developed by Vapnik et al. based on statistical learning theory that calculates the longest distance between the classes to sort out different classes (Cortes & Vapnik, 1995)(Vapnik, 1999). SVM draws a hyperplane in the training set that maximizes the distance of the data from different classes and covers the possible largest part of the data from the same class.

SVM uses various core functions (Lee et al., 2008). These functions are linear, polynomial, sigmoid, and radial based functions (RBF). The RBF core function is mostly preferred in classification studies using SVM. According to the performance assessments, the most successful results are achieved with the RBF core (Ayhan & Erdoğmuş, 2014), so the RBF core function is used in this study.

KNN algorithm (Cover & Hart, 1967) developed by Cover et al. is a statistical and supervised algorithm. It is based on the principle of determining the class of the data by considering its distance to k number of neighbors. In the calculation of the distance between data, various methods, such as Chebychev distance, Manhattan distance, and Euclidean distance, can be used (Mulak & Talhar, 2015). In this study, the Euclidean distance method is used.

Experimental Results

Various databases have been used for training and testing purposes in studies on the detection of facial expressions. In this study, the RaFD (Langner et al., 2010) face database was used. RaFD provides successful results in facial expression studies (Ahmady et al., 2013)(Shokrani et al., 2014)(Kanan & Ahmady, 2012).

RaFD is a free face database that contains facial images of Caucasians. These facial images were obtained with five cameras with different angles (i.e., 0, 45, 90, 135, and 180 degrees). Using the content of this database, researchers can conduct studies on facial expression analysis and detect the viewing angle and head orientation. According to the studies of Ekman mentioned in the introduction, the fact that the database consists of Caucasians does not constitute an impediment for the analysis of universal emotional expressions. Moreover, the database has eight different facial expressions (i.e., neutral, angry, sad, afraid, dis-gusted, surprised, happy, and contempt) and three different viewing angles (i.e., straight, right, and left). All images were prepared based on FACS examples. The database has images of 49 people, 39 adults and 10 children; 6 of the children are girls, and 19 of the adults are women. In this study; for training process 235, for testing process 100, totally 335 images were used.

Table 2 presents the total number of data records for each feature cluster, the number of reduced features, and the locations of the selected features on the face after applying SFS. For example, lines 13-16 in Table 2 refer to the length between the 13th and 16th points.

These features were classified with the SVM and KNN algorithms. The success rates are presented in Table 3 and Table 4.

Table 2: Reduced features as a result of SFS Algorithm

Data Type	Total Data Number	Data Number after SFS	Selected Features
Distance	325	6	13-16, 6-12, 12-17, 21-26, 6-15, 9-13
Ratio	52650	4	1-8 / 2-22, 1-11 / 3-11, 6-19 / 15-25, 7-21 / 15-19
Distance + Ratio	52975	5	1-8 / 2-22, 20-24, 1-6 / 11-22, 1-2 / 2-11, 1-23 / 7-20

Table 3: Complexity matrix of the features obtained after SFS by classification with SVM

Expression	Distance Data (%)	Ratio Data (%)	Distance + Ratio (%)
Neutral	60	80	60
Happy	95	95	100
Angry	100	95	100
Sad	85	85	70
Surprised	90	100	95
Average	86	91	85

Table 4: Complexity matrix of the features obtained after SFS by classification with KNN (k=1)

Expression	Distance Data (%)	Ratio Data (%)	Distance + Ratio (%)
Neutral	50	65	40
Happy	100	100	100
Angry	95	90	100
Sad	65	80	80
Surprised	95	100	95
Average	81	87	83

In both classification algorithms, it has been observed that the most successful results are obtained as a result of entering only the ratio feature data. One of the most important results of the study is that a high level of success has been achieved with only four facial ratio feature data records. Comparative results of the proposed algorithm with other studies extracting features are shown in Table 5.

Table 5: The Comparison of the proposed method with the other methods Detecting Facial Expressions

Researchers	Database	Methods	Neutral (%)	Happy (%)	Angry (%)	Sad (%)	Surprised (%)	Average (%)
Lee et al. (Lee et al., 2016)	Mobile platforms	AAM+KNN	80	86	85	77	95	85
Ren et al. (Ren & Huang, 2015)	BU-3DFE	AAM+SIFTW+SVM	-	84.1	82.5	77.3	84.5	81.4
Mistry et al. (Mistry et al., 2014)	Cohn Kanade (CK+)	AAM+LBP+ANN	-	86.7	83.3	96.4	93.3	88.8
Cheon et al. (Cheon & Kim, 2008)	Facial Expression Database (FED06)	Dif-AAM+KNN (k=5)	92.5	93.69	82.11	-	96.29	91.52
Beszedes et al. (Beszedes & Culverhouse, 2007)	Private database	AAM+SVM	78	95	84	-	95	-
Senechal et al. (Senechal et al., 2012)	GEMEP-FERA	LGBP+AAM	-	96.8	96.3	76	-	83.5
Proposed	Radboud	KNN(k=1)	65	100	90	80	100	87
		SVM	80	95	95	85	100	91

Conclusion

This study presents an algorithm with high success where features are minimized for the detection of facial expressions. In experimental studies using the Radboud database, 26 important keypoints have been determined for face images. The Euclidean distance of these 26 keypoints to each other was calculated, and 325 distance feature data records were obtained for each image. Ratios of the 325 distance data records were calculated, and 52650 ratio data records were obtained.

In the next step, distance, ratio, and distance + ratio data were analyzed with the SFS feature selection algorithm, and six distance, four ratio, and five distance + ratio feature data records were obtained. These features were classified with SVM and KNN classifiers, and the comparative results are presented in the tables. It was observed that the highest success rate was achieved by using only ratio feature data. Thus, facial expressions were predicted correctly 92% of the time using the SVM algorithm with four ratio feature data records. With the KNN algorithm, an 87% success rate was achieved with the stated four ratio features.

For future research, the proposed system could be strengthened with different features and different classification algorithms. Angles between the lines formed by the 325 distance data records can be determined as a new feature cluster. Since the changes in the muscles that occur when facial expressions are formed also change the important facial points, angles between the lines are formed by distances. A study could be conducted on the unified effect of angle information and distance and ratio and distance + ratio data on the results. Moreover, the analysis results for the five conditions obtained in this study could be used in the various fields studying facial expressions, as stated in the introduction.

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GAMIFICATION: SOFTWARE USAGE ECOLOGY

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Abstract: Gamification is applied in academia and industry and is being studied in the last years. Gamification is nowadays applied to several areas, such as learning, computer science, business, marketing, tourism, among others. Research performed till now suggests that its usage may improve students' and workers' motivation and increase study, productivity and sales. Nevertheless, there are many forms of implementing, according to each industry. Supported in the literature, we identified the game components, game mechanics, and game dynamics, used as part of any gamification implementation. Then, we selected some specific cases in e-learning, computer program learning, open source software development, and crowdsourcing. Finally, we list some of the main software employed in this fields, identifying also implemented features. This allowed us to find the great complexity and variety of implementations. It also enabled us to find ether practitioners or researcher use the word gamification for a broad range of approaches.

Keywords: Gamification, Game Design, Gamification Tools, Software

Introduction

Gamification has increased awareness since its definition, (Google, 2017). Google Scholar indexes 8,660 scientific publications in 2016, and in 2011, the year when the concept was coined, 481 publications. Gamification reached the peak of popularity in 2014 (Google, 2017). Gamification corresponds to the "*use of game elements, in non-game context*"(Deterding, Dixon, Khaled, & Nacke, 2011, p. 9), with the objective of achieving individuals' engagement towards defined goals. In several studies, gamification concept is used with other concepts, for example, simulation, game, and serious games (Deterding et al., 2011). The gamification concept has been used in several contexts, mainly related with education, management, simulations of real situations, serious games, gaming, e-banking, and marketing (Costa & Aparício, 2006; Costa, Aparicio, Aparicio, & Aparicio, 2017; Costa & Costa, 2010; Costa & Costa, 2010; Manuela Aparicio, 1999; Miller, 2013; Rodrigues, Costa, & Oliveira, 2014, 2016). Authors have applied game-design elements, game principles, and game mechanics in non-game contexts (Bunchball, 2010; Deterding et al., 2011; Slegers, Ruelens, Vissers, & Duysburgh, 2015).

The main goal of this paper is to identify the game components, game mechanics, and game dynamics, used as part of gamification implementation. The methodological approach of this paper follows a documental study method. First, it is made a review on the theoretical background on the topic, then applying a theoretical framework, we analyze a set of cases.

The paper is structured in two main parts. The first part is related to the literature review on gamification and associated concepts. The second part relates to the presentation of each study case and analysis of the elements and software used to instantiate gamification on the several contexts. Finally, we present the conclusions of our analysis.

Gamification Vs Other Concepts

The gamification concept was coined in 2011 by Deterding et al. (2011), the definition has been used since then and states for "*Gamification is the use of game design elements in non-game contexts*." (Deterding et al., 2011, p. 9). Although gamification concept derives from the word game, it does not inevitably suggest gaming, or playfulness, or even serious game contexts. Gamification has to do with the use and application of design

dimensions to induce motivational behaviour on users in a certain context, usually inducing individuals into intention, and attitudes to achieve a pre-defined goal. For example, on a gaming environment, certain dynamics attains a set of rules and guidelines, and those dynamics induces a willing to play. Schell proposed a game definition "*A game is a problem-solving activity, approached with a playful attitude*" (Schell, 2008, p. 37). Transporting those dynamics and elements into different contexts, also induces users, learners, workers, to the willing of fulfilling a set of challenges, and interactive guidelines, in a way that is voluntary to the users. This willingness is a result of a perceived intrinsic value, which engages users in the various activities. In this context, it is important to address a disambiguation of the term gamification and the related term of a serious game. A Serious Game corresponds to a developed system within the usage of a game technology, which is specially designed using game principles, to achieve a purpose different than just entertainment (Pañella, 2012), the serious purpose can be as serious as a medical training environment. Marczewski (Marczewski, 2013) defines this particular concept "serious game", which is conceptualized, as a fully developed game to be used in contexts, other than pure entertainment. Systems like teaching games, simulators, meaningful games, and purposeful games. Figure 1 shows the overlaps between experience, entertainment, and multimedia, which corresponds to serious games.

Figure 1. Serious games based on (Costa et al., 2017; Laamarti, Eid, & Saddik, 2014)

Students can learn using real gameplay environment, the game is not designed for playful purposes, but it serves as a simulator of a real scenario in a virtual version set. These virtual learning scenarios are extracted from the real world, and allow a safe learning environment for practising and testing knowledge. A "meaningful game" uses gameplay to endorse a specific message to the player. A "purposeful Game" creates certain outcomes directly into the real world. These terms lead conceptually to the term "gameful design", corresponding to a process, where "game thinking" has been used (Marczewski, 2013). Figure 2 illustrates the main differences between these concepts. From the figure, one can conclude that the unique characteristic which is present in a game and is no present on other contexts is the playfulness just for fun purpose. Game thinking is present in the game inspired design, in gamification, in serious games, and in games. Gamification does not comprehend playing a game just for fun or playing a game for that matter. Gamification uses "game thinking" and "game mechanics" in non-playful contexts to engage users in solving problems.
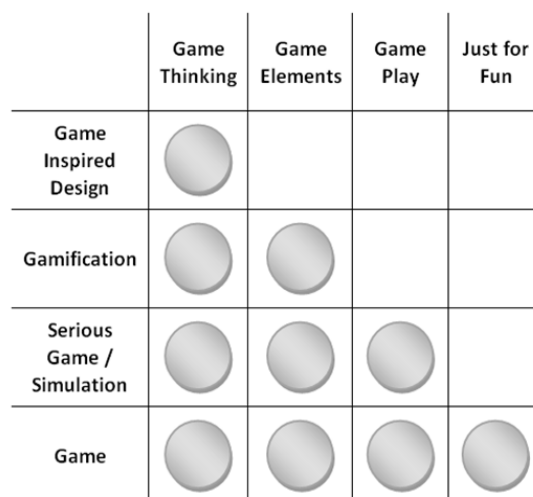
Figure 2. Gamethinking, broken down by design goals (Marczewski, 2013)

Gamification is implemented in applications and processes to improve user engagement, return on investment, data quality, timeliness, and learning. From a bibliometric study results showed the evolution of these concepts two main digital libraries, verifying that gamification studies registered a considerable increase throughout the years, whereas the related concepts registered a decreased in both digital libraries (Costa et al., 2017). From that same study, the authors found that "Gamification" term or "Gamified" is mainly related to other keywords, such as motivation, serious games, crowdsourcing, engagement, user experience, learning, and design. The terms evolution registered a crescent tendency of the relationship between "gamification", "engagement" and "user experience". These results may also indicate that new areas of research are arising. It was observed that researchers are transposing gamification into other areas, rather than pure technology engineering, education, learning, e-learning, design, motivation, games, crowdsourcing, collaboration, behavior, software, games, design, interaction, engagement, motivation, technology, experience, enterprise, and serious, are among the most studied topics. From the previous analysis, we verified the progress of gamification related terms and concepts. From the Web of Science directed searches (WoS, 2017), we found the scientific fields related to gamification Table 1.

Table 1. Gamification relation with other scientific fields (Costa et al., 2017)

Research Areas	% Gamification publications
Computer Science	35%
Education Educational Research	21%
Engineering	17%
Business Economics	4%
Psychology	3%
Telecommunications	3%
Social Sciences Other Topics	3%
Health Care Sciences Services	2%
Medical Informatics	2%
Information Science Library Science	2%
Public Environmental Occupational Health	1%
Science Technology Other Topics	1%
Communication	1%
Rehabilitation	1%
Robotics	1%
Operations Research Management Science	1%
Nursing	1%
Environmental Sciences Ecology	1%
Automation Control Systems	1%
Total of publications	**100%**

Education/educational research and computer science represent 56% of the scientific publications. Engineering, business and economics, and psychology weights 24% of all of the publications related to gamification. The most cited scientific publications, 2846 in total, on gamification are of Deterding, Sicart, Nacke, O'Hara & Dixon (2011). The usage of game dimensions has been studied by several authors (Aparicio, Costa, & Braga, 2012; Bunchball, 2010; Costa, 2011; Costa & Costa, 2010; Deterding et al., 2011; Gatautis, Vitkauskaite, Gadeikiene, & Piligrimiene, 2016; Kuutti, 2013; Laamarti et al., 2014; Marczewski, 2013; Pereira, Costa, & Aparicio, 2017; Piteira & Costa, 2017; Rodrigues et al., 2014, 2016, Werbach & Hunter, 2012, 2015). Game elements define the "characteristics" which are present in games, as a set of "building blocks", that may or may not be all present in a game (Deterding et al., 2011). Game elements can be categorized into five levels: first game interface design patterns, second game design patterns and mechanics, third game design principles and heuristics, fourth game models, and in fifth game design methods (Deterding et al., 2011). Some authors refer to "game elements", however elements may also refer to components in some studies, therefore instead of elements, we refer in this study as game dimensions. The way these dimensions are aggregated differ from framework to framework, and from model to model. Table 2 presents various definitions according to different levels of dimensions. To operationalize these concepts, researchers and practitioners developed several approaches, among the most used we can find: Octalysis, (2015), Werbach and Hunter model (2015), and a recent model named Gamification Model Canvas (Jiménez, 2015).

Table 2. Gamification dimensions' definitions (Costa et al., 2017)

Dimensions	Definitions	Authors
Game mechanics	*"Commonly reoccurring parts of the design of a game that concern gameplay"* (Deterding et al., 2011, p. 12) *"Mechanics are already more specific elements in the way that they imply towards more specific actions"* (Kuutti, 2013, p19) *"Mechanics are the basic processes that drive actin forward and generate players engagement (Werbach and Dan, 2012, p. 79)."*	(Deterding et al., 2011; Kuutti, 2013; Werbach & Hunter, 2012)
Game components	*"Components are specific instantiations of mechanics and dynamics"* (Werbach and Dan, 2012, p. 82) *"Components are specific applications that can be seen and used in the interface of the game"* (Kuutti, 2013, p. 19) *"Game components act as stimuli and are often directly perceivable from the consumer perspective."* (Gatautis et al., 2016, p.92)	(Gatautis et al., 2016; Kuutti, 2013; Werbach & Hunter, 2012)
Game dynamics	*"Dynamics describes the run-time behavior of the mechanics acting on player inputs and each others outputs over time."* (Hunicke et al., 2004) *"Dynamics are the big-picture aspect of the gamified system that you have to consider and manage but which can never directly enter into the game"* (Werbach and Dan, 2012, p. 82) *"Dynamics are the highest level of abstraction of game elements. They are themes around which the game revolves."* (Kuutti, 2013, p. 18)	(Hunicke, LeBlanc, & Zubek, 2004; Kuutti, 2013; Werbach & Hunter, 2012)

Figure 3 pictures a combination of the gamification pyramid containing the elements based on the hierarchy proposed by Werbach and Hunter (Werbach & Hunter, 2015), and the literature review which instantiates those dimensions (Costa et al., 2017). Those three elements, dynamics, components, and mechanics characterize different interconnected levels, for example, defining the design principles (Dynamics) is crucial to choose the adequate actions structures (Mechanics) to select the suitable interface level displays (Components).
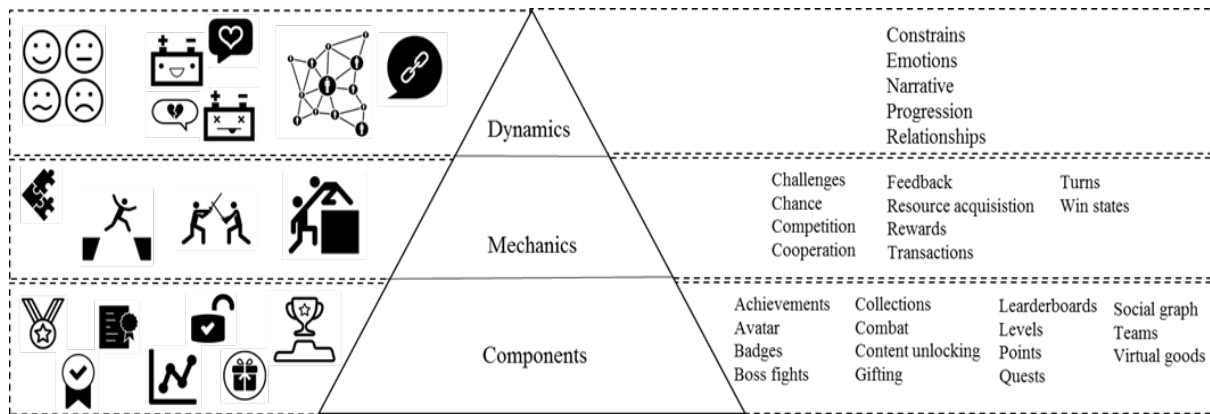
Figure 3. Pyramid of Gamification Elements (Costa et al., 2017; Werbach & Hunter, 2012)

Figure 3 depicts on the left side iconography associated with the different levels of gamification dimensions. Game dynamics usually are instantiated in emotions, constraints, progression perception, narratives, and relationships. Game mechanics correspond mainly to a set of actions or processes which implement the challenges, feedback, cooperation or competition, rewards systems, among others. Mechanics define the guidelines, for example suggesting that if the user watches a video, or do a quiz, gets extra points to unlock the next level. Components are more "tangible" elements, as for example, we usually find badges, avatars, achievements' boards, gifts, points, just to exemplify.

The next section presents four different cases where gamification elements were introduced, describing the main objectives and contexts of application.

Cases

Case 1: SmartMOOC

This case corresponds to a solution presented to the problem of improving computer programming, especially in the first year of college (Piteira & Costa, 2017). This solution has as the main purpose helping the student learning programming. The emphasis is on the core concepts of programming (Figure 4), like variables, control structures. The language uses JAVA. The solution was implemented using Moodle (http://iscte.acm.org/elearning/). The purpose of using Gamification was to improve motivation of the students. The narrative used is very related to a traditional lecture with some exercises. This study is still undergoing, and the final was not reported yet.

Figure 4. Print screen of the SmartMooc frontend

Case 2: Kaboom Academy

This case corresponds to a solution presented to the problem of improving computer programming (Pereira et al., 2017). This solution has as the main purpose helping the student learning programming. The emphasis is on the basic concepts of programming, like variables, control structures. The language used is JavaScript. The solution was implemented using firebase platform (Figure 5). Gamification is one of the approaches used to improve motivation of the students.   Kaboom Akademy (https://kaboomacademy-1443a.firebaseapp.com/login) is a project very similar to the SmartMOOC. However, its narrative is much more informal.
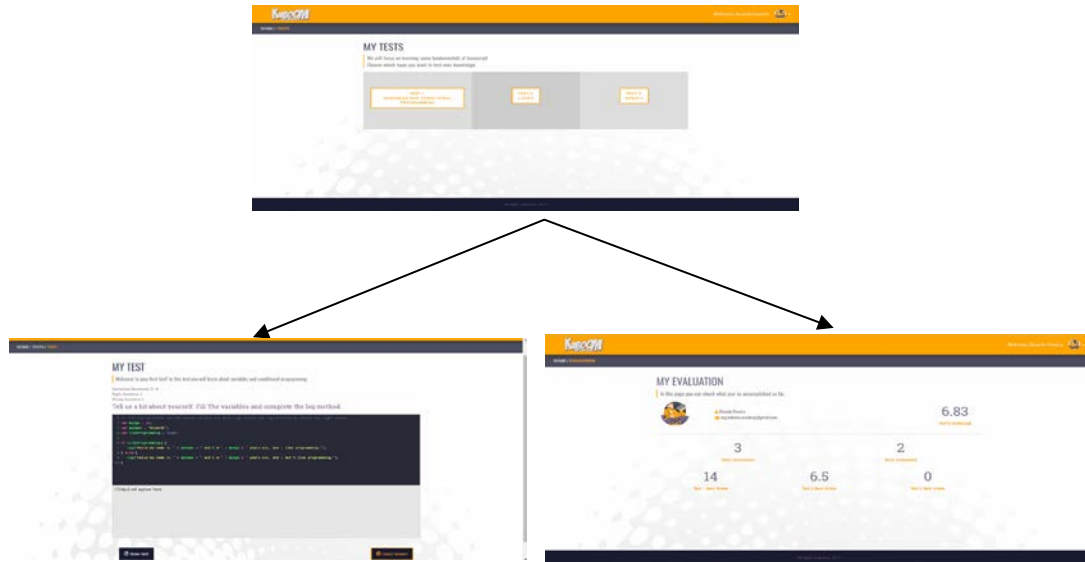
Figure 5. Prototype of Kaboom Akademy

Case 3: Guild Software Development

This solution started as a need to support an open source community around an open source application (Costa, 2011). The solution initially proposed was supported in Drupal. Then, it evolved to Wordpress. Other software and services were also used, like Github. Gamification was proposed as a way of motivating the community and improve engagement in the project. The narrative is related to a metaphor of a middle age craft guild (figure 6), where the user starts as an apprentice, and then became a journeyman and ended as master. There is also several types of the user using the same hierarchy: end user (brothers), the developer (craftsman), testers (worriers).
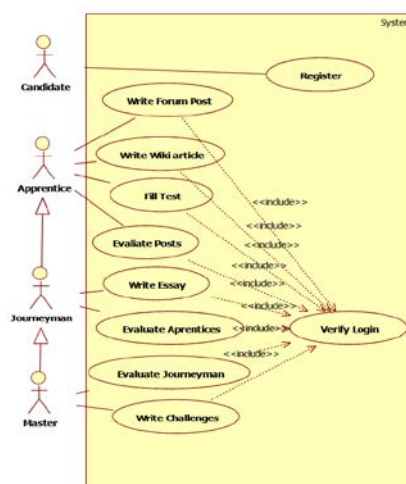
Figure 6. Guild functionalities

Case 4: Crowdsourcing

This solution started generic solution to support crowdsourcing projects (Aparicio et al., 2012). The solution was developed using WordPress as the main platform. Then, several plugins were used to support the implementation of gamification. The purpose of using Gamification was to improve motivation of the potential participants.
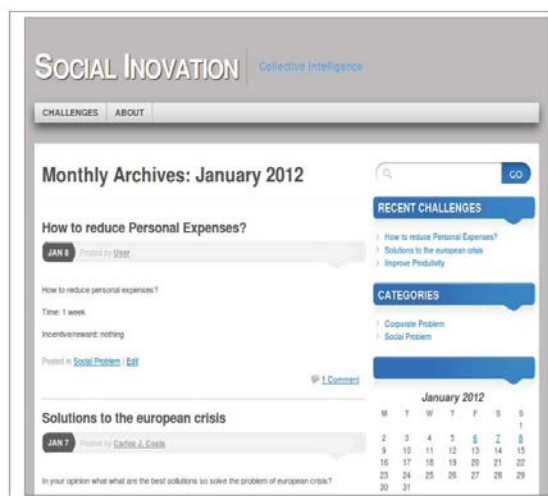
Figure 7. System to support crowdsourcing

Summarizing Cases

Table 3. Gamification dimensions' definitions

	SmartMOOC	**Kaboom Akademy**	**GuildSW**	**CrowdSourcing**
Authors	Piteira & Costa. (2017).	Pereira, Costa, & Aparicio (2017)	Carlos (2011)	Aparicio, Costa, & Braga (2012)
Dynamics	+ -	+	-	+ -
Mechanics	+ -	+ -	-	+ -
Components	+	-	-	-
Software	Moodle	Auto developed software using firebase	CMS (Drupal then Wordpress) and Git-Hub	Wordpress
Gamification	Plugins	Features Incorporated in the software	Components and Plugins	Plugins

Notes: + Fully implemented
            +- Satisfactory implemented
            - Poorly implemented				

Conclusions

Gamification is widely employed and disseminated in the corporate context. In order to analyse how software is used to support gamification, we study four cases. Two cases were related to e-learning (SmartMOOC and Kaboom Akademy), one case was related to software engineering, and open source (GuildSW) and another case was related to crowdsourcing (CrowdSourcing). The technology used was different according to the case. Moodle was used in SmartMOOC. In the Case CrowdSourcing, it developed a solution supported in Wordpress. In both projects, plugins were used to implement gamification. Kaboom Akademy is a more informal project, but main purposes are very similar to the purposes of SmartMOOC. GuildSW had a more troubled process. In what concerns, conceptual solution, it was very stable. However, the implementation changed significantly. Originally the implementation was supported in the Drupal. However, then, it changed to WordPress using plugins. However, there was also a need of connecting other tools and services, like Github. In what concerns level of dynamics, mechanics and components implementation change significantly.

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KURDISH RECOGNITION SYSTEM DIGIT

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Abstract: The security problems arising with the developing technology have put secure systems in quest of being developed with new techniques. The voice processing technology among these techniques has gained great importance. This situation has directed the reliability ensuring the man-machine interaction together with the voice processing applications such as speech recognition, speaker recognition, converting audio to text or converting text to audio to the design of high and correct systems. In this study, a digit speech recognition system consisting of the audio examples of digits from 0 to 9 in Kurdish spoken in Turkey was realized. For this purpose, audio recordings were obtained from 102 adult speakers who speak Kurdish. The feature vectors of the audio data acquired from these recordings were obtained with the Mel-Frequency Cepstral Coefficient by using different windowing methods, and the success rates were compared by conducting the recognition process with Dynamic Time Warping according to the feature vectors obtained.

**Keywords:** Speech processing, Kurdish, MFCC, DTW.

Introduction

Nowadays, speech recognition systems play an important role especially in personal applications that require password verification. Therefore, such applications have led to the widespread use of speech recognition systems and the development of speech recognition systems of different languages and dialects based on different voice features. This development first occurred in English, and then its applications were developed in French, Spanish, German, Danish, Japanese and Chinese. The aim of this study is to develop a speech recognition system in the Kurdish language.

Kurdish is an inflected language within the Indo-Iranian language group. Kurdish is the most spoken language after Turkish in Turkey, after Arabic, Turkish and Persian in the Middle East and Asia (Khan & Lescot., 1971, Wikipedia). The fact that a Kurdish speech recognition system to be created in this context can be used by wide masses also makes this article important.

Speech is a complex biometric signal produced as a result of various transformations that occur at the acoustic and articulation level (Trivedi., 2013). Speech recognition is the automatic extraction of linguistic information by obtaining acoustic models from speech signals (Karadaş., 2014). Speech recognition systems design systems with the capability to make easier, quicker, and more effective and more reliable processes with the human and machine interaction that supports artificial intelligence, speech-to-text and text-to-speech application areas. The most frequently used speech recognition applications in daily life are disabled aid applications, robotics applications, telephone banking applications and automatic pager applications.

The speech recognition process consists of the procedures of receiving the voice signal as an input, processing the voice and recognizing the voice signal as an output. In a general speech recognition system, a speech signal received by a microphone or telephone is first passed through a pre-treatment stage, and the distinguishing feature (property) vectors are extracted to perform the recognition of the speech expression, and a model is created by training these feature vectors extracted. Then, the model of the test speech signal, which will be questioned in terms of which speech expression it is, is extracted and then whether there is a match is determined by comparing it with the previously modelled (by training) templates. The block diagram of a speech recognition system is presented in Figure 1.
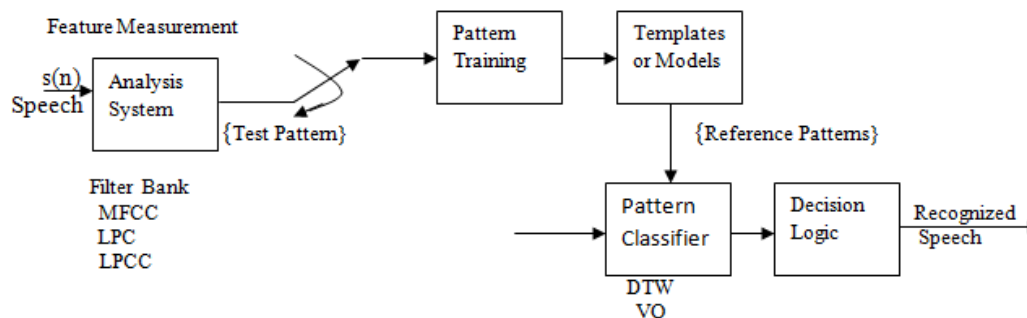
Figure 1: Block diagram of a speech recognition system (Rabiner & Juang., 1993).

The process steps that make up a typical speech recognition system defined in Figure 1 consist of 4 main blocks:

Feature Measurement (Extraction):
The most basic process to be performed in order to process speech signals of different individuals in speech recognition systems is to extract important information (distinguishing features specific to the speech expression) from the speech patterns of each speaker. However, speech patterns should be filtered from the noise effect resulting from various factors to perform this process. For this purpose, the speech patterns should be first put through a pre-treatment stage by being subjected to a filtering method before the feature extraction process.

The most frequently used Filtering and feature extraction methods are as follows:
- Wiener Filter
- Spectral Subtractive
- Kalman Filter
- Mel Frequency Cepstrum Coefficients (MFCC)
- Linear Predictive Coding (LPC)
- Linear Predictive Cepstral Coefficients (LPCC)

Pattern Training:
The feature that makes up the template corresponding to the speech expression of the same class is used in obtaining the parameters. A whole template that represents the feature parameters of each speech class is called a Reference Template.

Pattern Classification:
The classification process is the recognition of the speech signal by comparing the test speech signal with Reference Template examples. The most frequently used techniques to perform this process block are as follows:
- Dynamic Time Warping (DTW),
- Vector Quantization (*VQ)*

Decision Logic:
A similarity score is obtained between the speech signal put through the test process and the Reference Template in the final block of the speech recognition system. The highest similarity score will perform the recognition process. The materials and methods used for the development of an automatic digit recognition system were theoretically summarized in the remaining parts of this study, and then it was concluded with the conclusion part after presenting the experimental results obtained.

Materials and Methods

In this study, database sampling that consists of Kurdish speech samples was created to recognize Kurdish digits. With this database created, distinguishing features (feature vectors) of each speech signal were obtained using the MFCC method. Feature vectors were obtained by using the MFCC method together with Hamming, Hanning and Rectangular windowing techniques. Afterwards, the feature vectors obtained were modelled by training with DTW. At the test stage, whether there is any speech was questioned by comparing the given speech signal with the templates in the training set.

As a result of this study, a digit recognition system was developed in Kurdish, and its effects on the Kurdish speech recognition system were investigated by applying different windowing approaches to the MFCC feature extraction method.

Database Sampling

For an automated speech recognition system to be realized, it is primarily required to create databases that contain the voice signals suitable for the systems that are aimed to be realized. Detailed information on the database features used in this study is presented in Table 1.

Table 1: The features that make up the dataset.

	Number of speakers	Age interval	Number of words	Number of repetitions	Words told
Adult Male	76	19-55	10	3	0,1,2,3,4,5,6,7,8,9.
Adult Female	26	19-52			

As is seen in Table 1, the numbers were taken from 102 adult speakers from different age and gender groups. Speeches taken from each speaker from 0 to 9 were recorded as a single file. 3 records were taken from each speaker. Therefore, three (Record1, Record2 and Record3) speech files were collected for each speaker. In this study, each record file was used as training and test data alternately as is shown in Table 2. So, for each record, the DTW algorithm is repeatedly applied to one out of the 3 folds, while two different folds are held out each time.

Table 2: Training and Test data sampling.

Training Data	Test Data
Record1	Record2 and Record3
Record2	Record1 and Record3
Record3	Record1 and Record2

It is necessary to determine the voiced (spoken) parts in any file recorded, and remove the silent parts. In this study, the determination of the voiced and silent parts was made with signal energy and spectral centre parameters.

The voice records were obtained from silent environments or office environments with little noise. General Mobile Discovery II+ brand cell phone and the Easy Voice Recorder Pro voice recording programme loaded in this phone were used in taking the voice signals. The digital recording format is mono, 16 bit, 22050 Hz and PCM Wave file format.

Methods Used

This part is about the methods used.

I. Wiener

Wiener filter is a method performed in the frequency space.
The Wiener filtering method is expressed by the following Equation 1 equality:

$$x(m) = \sum_{k=0}^{P-1} w_k y(m-k) \qquad (1)$$

- m: means the time series,
- $y^T = [y(m), ..., y(m-P-1)]$: input value,
- x(m) : filter output value, and
- $w^T = [w_{0,} w_{1,} ...., w_{P-1,}]$: means the coefficient vector of Wiener filter.

Error signal is expressed with the following Equation 2 equality:

$$e(m) = x(m) - w^T y \qquad (2)$$

The Wiener filter coefficients are obtained with the value that minimizes the average squared error expressed with $e^2(m)$.

II. MFCC

MFCC is one of the most widely used feature extraction methods in speaker recognition systems. MFCC is a numerical technique analysis that imitates the perception of human ears and is calculated based on FFT (Fast Fourier Transform) (Karasartova., 2011). The flow diagram of the steps that are necessary to obtain the MFCC coefficients is presented in Figure 2.
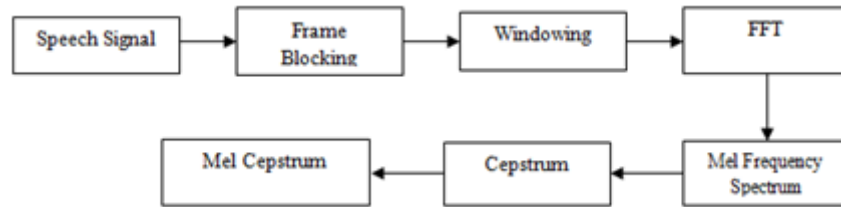

Figure 2: MFCC block diagram.

1) Frame Blocking: It means obtaining the characteristic features of the speech signal in a more stable state by processing it at small time intervals.

2) Windowing: Windowing can be defined as dividing a speech signal into a time period of a particular length. More generally, windowing is the multiplication of a framed signal with a special function. Windowing methods,

- Hamming,
- Hanning,
- Rectangular,
- Barlett and Kaisser.

The most frequently used methods for windowing are Hamming and Rectangular windowing examples. Hamming, Hanning and Rectangular windowing methods were used in this study. The functions of windowing methods are in the following equations (N: means the number of samples).

Hamming Window:
The Hamming window is expressed by the following Equation 3 equality:

$$w(n) = 0.54 - 0.46 \cos\left(\frac{2\pi n}{N-1}\right), \ 0 \le n \le N-1 \qquad (3)$$
$$w(n) = 0, \quad otherwise$$

Hanning Window:
The Hanning window is expressed by the following Equation 4 equality:

$$w(n) = \frac{1}{2}\left\{1 - \cos\left(\frac{2\pi n}{N-1}\right)\right\}, \qquad 0 \le n \le N-1 \qquad (4)$$
$$w(n) = 0, \quad otherwise$$

Rectangular Window:
The Rectangular window is expressed by the following Equation 5 equality:

$$w(n) = 1, \ 0 \le n \le N-1 \qquad (5)$$
$$w(n) = 0, \quad otherwise$$

3) FFT (Fast Fourier Transform): Fast Fourier Transform (FFT) takes the windowed frame from the time domain to the frequency domain. The Fast Fourier Transform signal is expressed by the following Equation 6 equality:

$$X_n = \sum_{k=0}^{N-1} x_k \, e^{-2\pi j k n/N}, 0 \le n \le N-1 \qquad (6)$$

4) Mel Frequency Spectrum: In this process block, the signal with "f" frequency in Hz unit is taken from Mel filter bank that consists of triangular waves that permeate the band. Therefore, the value of the signal in M(f) frequency unit is obtained with this process. The number of filters in Mel filter bank defines MFCC coefficient value.

The algebraic equality of the process of transforming the Mel spectrum and FFT frequency values in Hz into Mel frequency unit is as follows: $M(f) = 2595. \, log_{10} \left(1 + \frac{f}{700}\right)$.

5) *Mel Cepstrum:* The signal obtained from Mel Filter bank is taken to the time domain from the frequency domain using DCT (Discrete Cosinus Transform) after taking its logarithm, and Mel frequency Cepstrum Coefficients values are obtained.

III.   DTW (Dynamic Time Warping)

DTW is a classification method based on dynamic programming. This method is used to find the similarity between the same speech expression told by the speaker at different times and speeds. In the DTW method, the distance values that give the best match are calculated by comparing the model obtained from the feature vector of the test speech signal with the Reference Template models created from the training dataset. Afterwards, the Reference Template that is at a minimum distance to the test signal from these distance values calculated decides on the match model.

Results and Discussion

Kurdish digits from 0 to 9 were used in this study. The success rates of the MFFC method using Hamming, Hanning and Rectangular windowing techniques are compared with each other. The percentage of correct recognition of each technique based on its recognition result is shown in Table 3, and the Computational process time is shown in Table 4.

Table 3: The recognition accuracy results.

	DTW		
	Hamming	**Hanning**	**Rectangular**
MFCC	%99.03	%98.96	%99.26

Table 4: Comparation computational process results.

	Computation Time (Hours)		
	Hamming	**Hanning**	**Rectangular**
MFCC	23.363	22.790	22.234

According to the results obtained in Table 3 and Table 4, the Rectangular windowing technique yields better results than other windowing techniques in terms of recognition and computational process time in practice.

Conclusion

Within the scope of this study, it was aimed to develop a digit recognition system based on Kurdish speech patterns by modelling the feature vectors obtained with the Hamming, Hanning and Rectangular windowing approaches of the MFCC feature extraction method using the DTW method. Therefore, the analysis of different windowing techniques on the Kurdish voice system was examined. Furthermore, general information is provided on the methods used in the speech recognition field in this study. Following this study, it was aimed to reveal the speech recognition system that gives the best performance based on the voice structure of Kurdish by training MFCC and different windowing samples with the HMM (Hidden Markov Model) method.

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REAL TIME SOLID WASTE MONITORING USING CLOUD AND SENSORS TECHNOLOGIES

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Abstract: The rise of urbanization and increase of human population correspond to the amount of solid waste produced. Inappropriate solid waste management poses risk to the environment as well as to the healthy living of people. Outmoded way of solid waste management is a cumbersome and complex process, which utilizes more valued human effort, time and cost and is not well matched with advancement in technologies. In this work, a smart bin solution is shown with a three-layered architecture for IoT real time solid waste monitoring. The lower layer is installed with sensors for measuring waste levels in smart bins; the middle layer is comprised with both Wi-Fi and GSM technologies for data transmission to a central system. A cloud service for receiving and storing data from the sensors is on the upper layer. In order to collect waste, the corresponding cleaning service is notified whenever a smart bin level threshold is reached. Ultrasonic ranger sensor and laser distance sensors were implemented and tested. A web based system to store user's information necessary for monitoring was also developed. The technologies used in the proposed system can solve the problem associated with solid waste monitoring and management and thus provides green environment.

Keywords: Solid waste, Ultrasonic ranger sensor, Laser distance sensor, Cloud service, Smart bin, Real time solid waste monitoring.

Introduction

Solid waste refers to all non-liquid wastes which are produced from different sources such as households, commercials, institutions, parking and industries. Solid waste management is the most important service provided by every city government and serves as a prerequisite for the wellbeing of its residents. Inappropriate solid waste management poses risk to the environment as well as to the healthy living of the people. Rise of urbanization, increase of human population corresponds the social economic activities which are proportional to the amount of solid waste produced. Currently, world cities generate about 1.3 billion tonnes of solid waste per year. This volume is expected to increase to 2.2 billion tonnes by 2025. Waste generation rates will be more than double over the next twenty years in lower income countries (Hoornweg & Bhada, 2012). Solid waste management is advanced in developed countries and less so in growing economies. For instance, over the last two decades, European countries have increasingly shifted their focus with regard to municipal waste from disposal methods to prevention and recycling (States *et al*., 2016).

On the contrary (Mwesigye *et al*., 2009), waste management in growing economies is not coping with the growth of urban areas thus leading to poor waste management. Most of Municipal waste management efforts by local authorities are severely affected by low capacity to collect and transport waste. The authorities need more tools (e.g. a moving vehicle) and personnel, and better mechanisms to sustain municipal waste management operations (Zurbrugg & Eawag, 2003; Mwesigye *et al*., 2009). Although a direct solution would be to increase expensive and improve the infrastructure, efficiency of the existing capacity can be improved to mitigate the impact of poor municipal waste management to the environment through the application of Information and Communication Technology (ICT).

In recent past, several research activities were actively involved with Internet of Things (IoT), for instance in smart home applications an implementation of IoT for environmental condition monitoring in homes was done by Kelly *et al*.,(2013). also in resolving transportation issues a novel modular and multilayered vehicular data cloud platform based on cloud computing and IoT technologies was developed (He, Yan, & Xu, 2014), where by a novel software architecture for the vehicular data clouds in the IoT environment which has the capabilities to integrate numerous

devices available within vehicles and devices in the road infrastructure was proposed. Likewise in health systems a health industrial internet of Things (IIoT) enabled monitoring framework (Hossain & Muhammad, 2015) developed, where electrocardiogram (ECG) and other healthcare data are collected by mobile devices and sensors and securely sent to the cloud for seamless access by healthcare professionals, to mention but a few.

Unquestionably there also several efforts invested in solid waste management with IoT, in general, smart waste monitoring system consists of sensors and transmission medium, collecting different types of data regarding the waste detection level found inside a smart bin.

An automatic smart waste management system (Bashir & Banday, 2013) designed and implemented, the overall system of waste detection divided into four subsystems; viz smart trash system, smart vehicle system, local base station and smart monitoring and controlling hut, two load sensor and IR proximity sensor entangled, RF transmitter used to send the detection of waste to local base station where the RF receiver is placed, the local base station decodes the trash bin location and accordingly sends a signal to the smart monitoring and controlling hut which sends signal to Smart vehicular system about the location of the trash bin.

Smart Garbage Management System (Bhor & Morajkar, 2015), according to author four IR sensors embedded on a dustbin for waste level detection, GSM 900 modem used to send waste level data collected by Microcontroller, to the control station whereas monitoring of the distributed dustbin is been done, the same GSM module is connected to the computer and used to send the message to the contractor for cleaning the dustbin in additional a graphical user interface using MATLAB software was developed.

According to Hassan (2016) a smart city service for real time waste monitoring and collection was designed and developed, The system consists smart bins, each bin installed with Arduino Uno, ultrasonic sensor and Radio Frequency (RF) transmitter on the top of the container. When the container is full of waste, it sends signal to the control center which will have the level of waste in the containers and through GSM/GPRS, a message (SMS) will send to the mobile phone of the truck driver of which waste bin is full and need to be empty.

Furthermore, a Wireless sensor network prototype for solid waste bin monitoring with energy efficient sensing algorithm (Mamun *et al.,* 2013b), researchers proposed a three tier architecture system whereas sensor resides on the lower tier formed with wireless sensor networks, with ZigBee-PRO and GSM/GPRS embraced in middle tier. The gateways which is the middle tier are acting as a bridge between the sensor nodes in the lower tier and the servers in the upper tier. It receives ZigBee data from the sensor nodes and transmit the data to the servers through GSM/GPRS, the system provides real time bin information with a developed web application to monitor the output.

Nonetheless, Intelligent system for valorizing solid urban waste, the developed iEcoSys system (Intelligent Ecologic System) encouraging waste recycling and separation (Reis *et al.,* 2014), according to the author RFID technology, ZigBee technology and XBee modules together with Arduino Microcontroller were involved. The flow of information in the iEcoSys system begins with the citizen who acquires iBags, which allows him to be identified at the act of depositing waste. the system insists on GAYT (Get As You Throw) citizens are credited with the amount receivable for the recycled waste.

To date, only few studies detailed on solutions which have a consideration on communication technologies constraints found within an area. In this study both Wi-Fi and GSM technologies prototypes implemented and can used as indoor/outdoor based solution, become more convenient to users depending on type of communication technology accessible while using contemporary technology and thus giving users a wide range of choices to use. The table below provides the literature summary of different technologies, methods and some important features for real time monitoring such as map and alerts in solving the problem of solid waste management.

Table 1: A summary of systems that used different communication technologies and methods to monitor and manage solid waste over the last years.

| S/n	Authors	Communication Technologies	Location Map	Real Time Monitoring	Notification (Alert)
1.	Hassan (2016)	GSM/GPRS, RF(Tx/Rx)	NO	YES	YES
2.	Mamun *et al.,* (2016)	GSM/GPRS, ZigBee	NO	YES	YES
3.	Bhor & Morajkar (2015)	GSM/GPRS	NO	YES	YES
4.	Reis *et al.,* (2014)	ZigBee, FID	NO	YES	YES
5.	Bashir & Banday (2013)	RFID	NO	YES	YES
6.	Mamun, et al., (2013a)	RFID, ZigBee	NO	NO	NO
7	Catania & Ventura (2014)	ZigBee, Wi-Fi, GSM/GPRS	NO	YES	NO
8	Chowdhury & Chowdhury (2007)	RFID, Wi-Fi	NO	YES	NO

The realm of this paper is to design and develop an IoT based and real time solid waste monitoring prototypes. The developed system intends to reduce valued human resources effort, time and cost as well as to protect the environment and health living of the people. Modern technologies such as cloud system, Wi-Fi, GSM as well as ultrasonic ranger sensor and laser distance sensor are implemented. Offering a substantial way to optimize solid waste management increasing collection throughput and improve its sustainability.

The rest of the paper is organized as follows; materials and tools used in the study with the architectural designs of the system. Followed by practical implementation together with results and discussion of the developed system prototypes. Lastly, is the conclusion of the presented study.

Methods and tools

Proposed real time solid waste monitoring system architectures.

IoT real time solid waste monitoring can revolutionize today's solid waste management activities by enhancing smart waste management and building quality service for citizens. Figure 1 is the general architecture, it gives the overview of the designed solution for real time waste monitoring based on IoT. The general architecture portrays the interaction and communication among the distributed smart bins at different citizen's buildings (home, church, mosque, hospital, school e.t.c) after been registered into a web database of cleaning service central system where waste monitoring is done, also including a seamless transmission of waste data and storage to the cloud platform via internet service. Central system administrator browses and retrieves the processed information for waste monitoring and collection through the developed web platform.
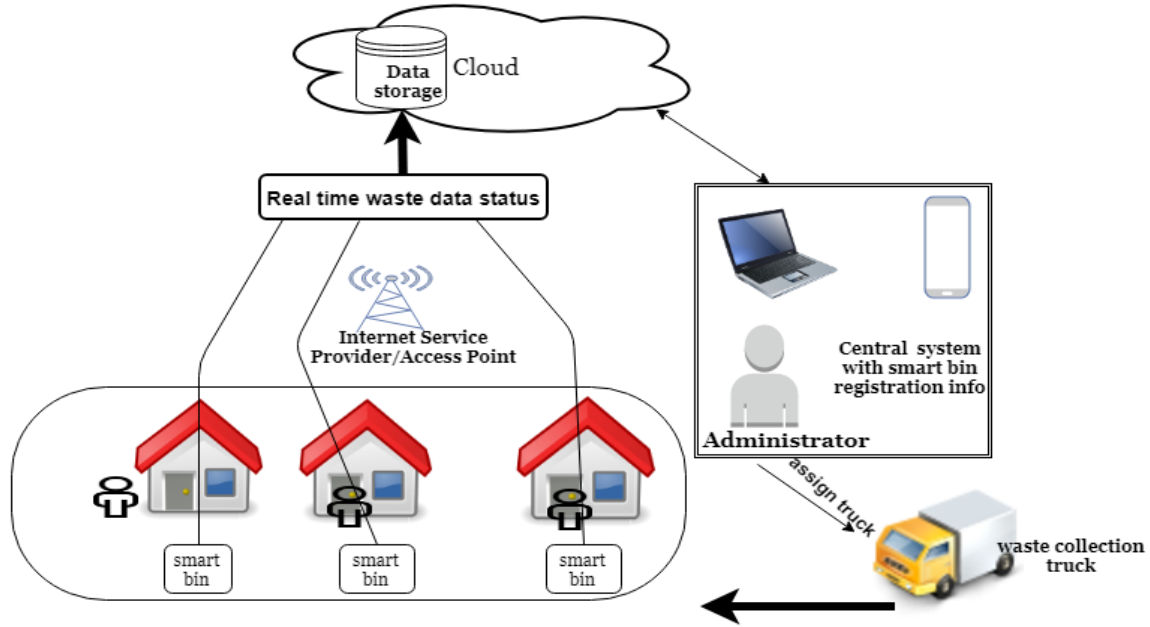
Figure 1. General architecture solution for real time waste monitoring and collection.

Figure 2, shows a smart bin prototypes solution's block diagram with a three-layered architecture for IoT real time solid waste monitoring, which are Lower layer, Middle layer and Upper layer.

The lower layer, is installed with Ultrasonic ranger srf05 sensors for measuring waste levels in smart bins, and 500mAh 3.7 V Lipoly batteries power supply source connected to microcontroller.

The middle layer, consists of the gateway which act as the bridge between the lower and upper layer, both Wi-Fi and GSM technologies integrated with the microcontrollers were applied in this layer, where by Adafruit Feather M0 Wi-Fi w/ATWINC1500 with a Wi-Fi module and 32u4 FONA SIM 800L with a GSM module were used for transmission of the detected solid waste data to the cleaning service central system cloud storage.

The upper layer, comprised with a cloud open source platform for the Internet of Things "Thingger.io" which is used for receiving, updating, storing and analyzing incoming data from the imbedded smart bin's sensor via the gateway after establishing connection with the server. The developed web based interface is also installed in the upper layer linked with the Thingeri.io, with role based restrictions for administrator to monitor the incoming sensor data in real time. During monitoring an administrator is been notified wherever the smart bin level threshold is achieved, administrator can visualize the location of the smart bin from the map and assign a driver to collect waste.
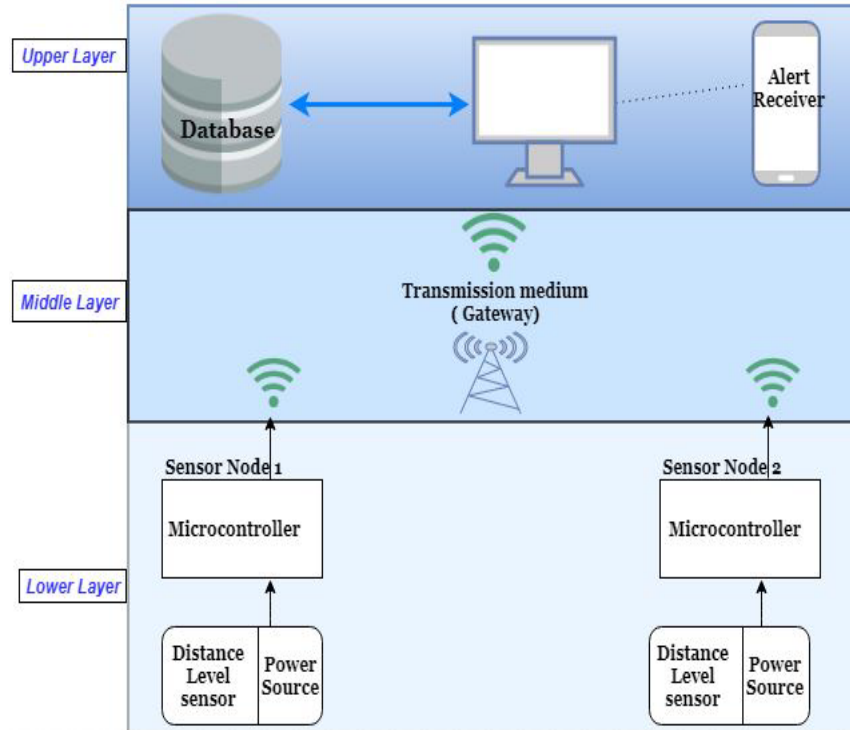
Figure 2. Block diagram of the smart waste monitoring and collection system

The flow chart diagram Figure 3 describes the architectural building blocks and logical decision involved from the detection of solid waste obstacle as soon as someone throws waste into a bin to waste collection process. The diagrams provide an impression on how the developed system prototypes will achieve real time monitoring and collection of solid waste. It also describes the working principles of the designed system block diagram and general architecture Figure 1 and Figure 2 for Internet of Things and Wireless sensor network in achieving real time solid waste monitoring.
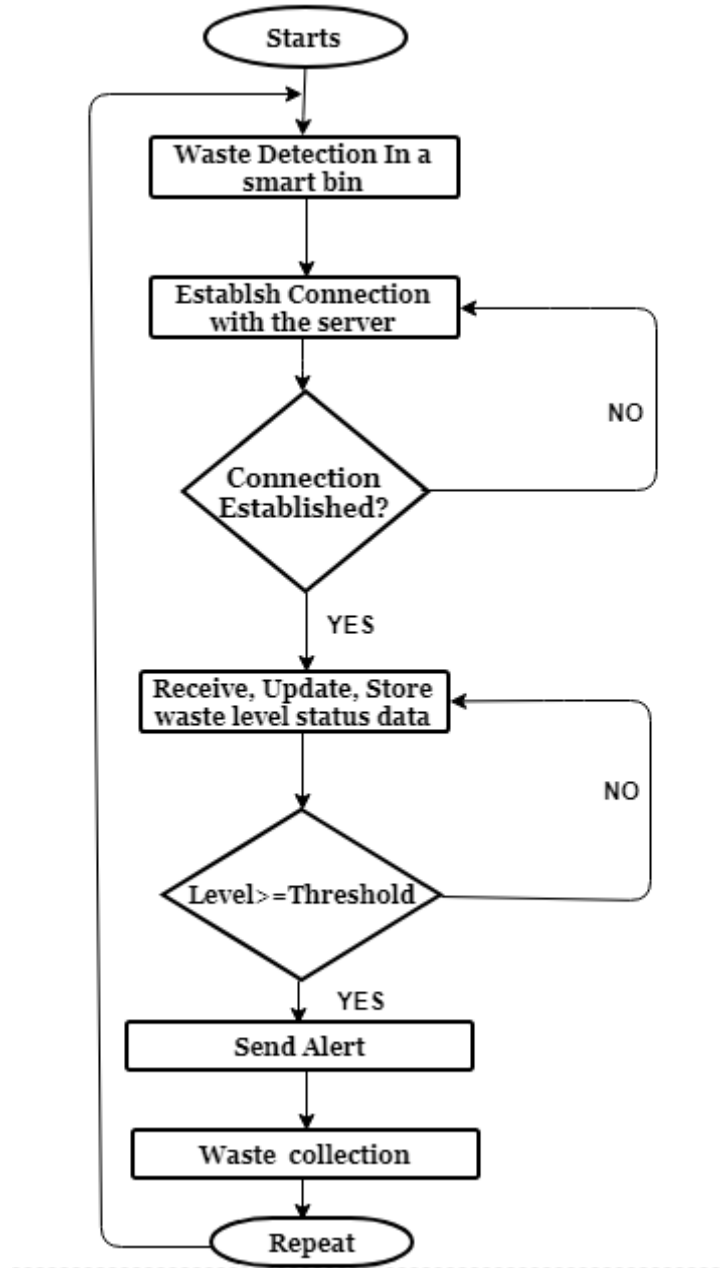
Figure 3. Flow chart diagram of the smart waste monitoring and collection system

Practical implementation of the developed prototype

The practical implementation of the developed system consists of monitoring processes from the sensors measurements and communication of the system prototype which is the heart of the whole structure of system, it shows how the designed system working and communicate with the hardware devices for the successful real-time monitoring. It consists of Microcontroller units; the Adafruit Feather M0 Wi-Fi w/ATWINC1500, 32u4 FONA SIM 800L GSM, Ultrasonic ranger srf05 sensors, 500mAh 3.7 V Lipoly batteries and LED backpack. A sketch (source codes) in C/ C++ with specific standard library written in Arduino IDE compiled and uploaded into the feather boards via Universal Serial Bus (USB) and thus became the brain of the boards, by controlling and coordinating all the hardware components defined operations systematically. The detected solid waste data and time of detection are

transmitted to a cloud storage Thinger.io for monitoring purposes. Figure 4 and Figure 5 shows the hardware components of solid waste monitoring system prototype.
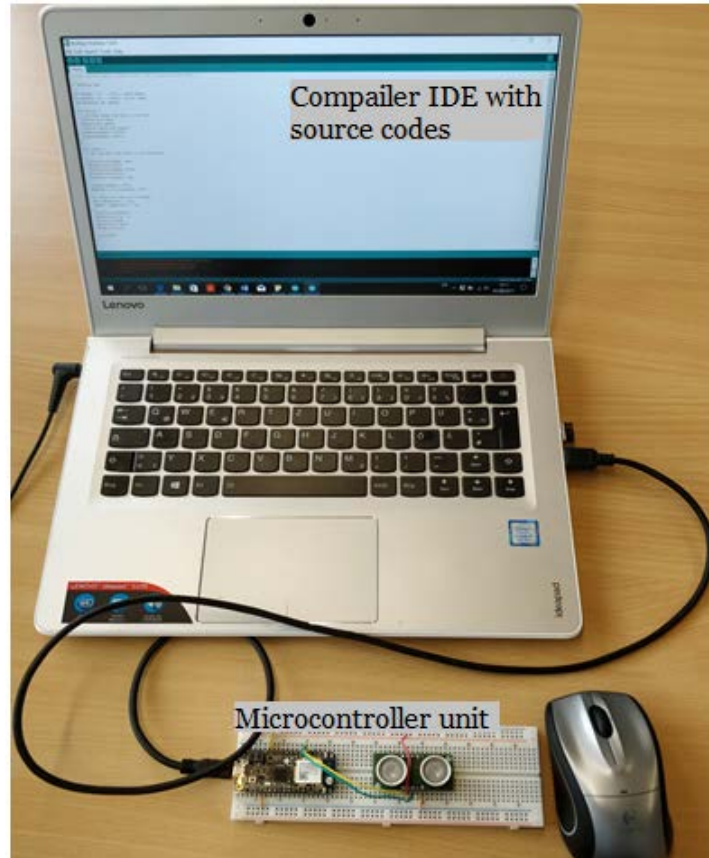
Figure 4. Communication with PC
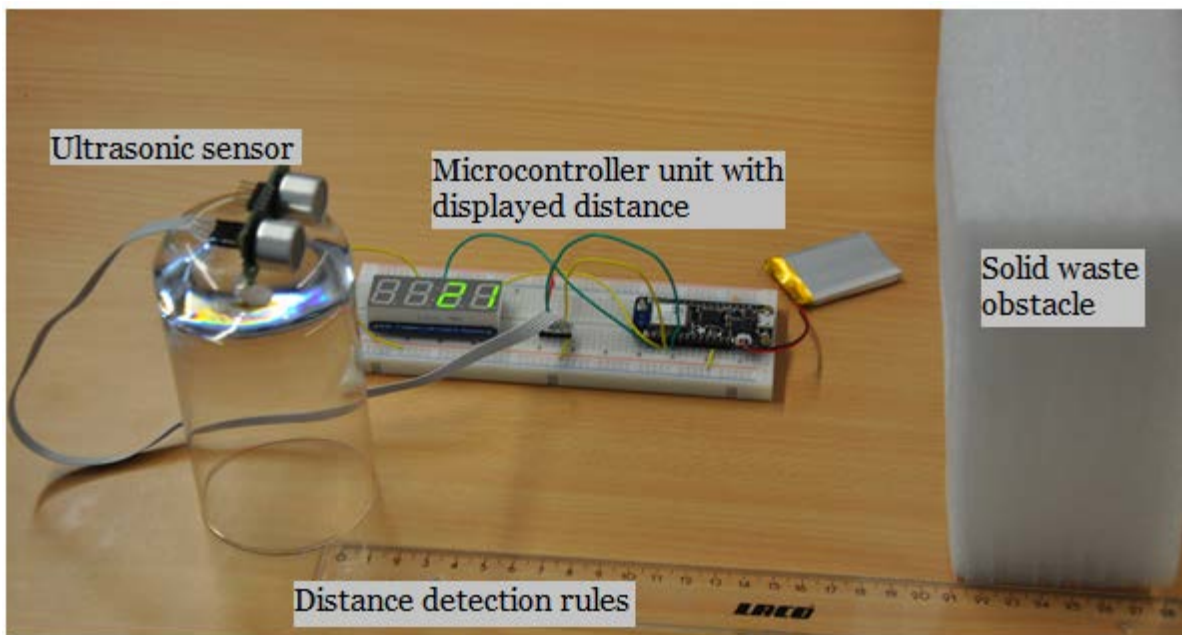
Figure 5. A working sensor prototype

Results and Discussion

In this section results obtained from the implementation of the developed prototypes are discussed. Number of test cases were run with different materials at different distance measurements from the sensor. With the successful internet connection between the sensor and cloud storage via the gateway. Real time solid waste sensor data in centimetres unit of measure, were transmitted at the specified programming time interval and plotted for visualisation. When the smart bin threshold is reached the visualisation remained constant means no more solid waste level was detected as shown in Figure 6, until waste collection service is completely done. A location map Figure 8 was given, depicting the actual location where the smart bin is installed during the monitoring, this is important for the planning of route during waste collection.
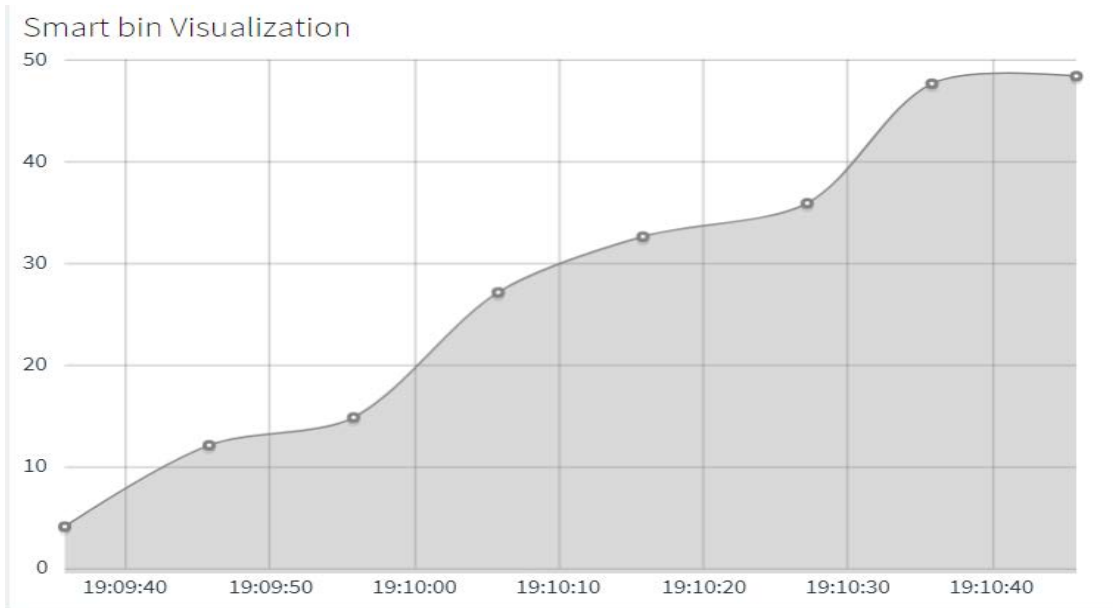
Figure 6. Real time solid waste distance level detection

An alert, both SMS and email were sent to the corresponding cleaning service administrator whenever the smart bin threshold is archived to take an action of assigning truck to go and collect waste. Figure 7 shows the SMS notification sent to the Android Mobile Phone during running of the tests. The SMS consists with the International Mobile Equipment Identity (IMEI) of the GSM module from the microntroller's board for the identification of the smart bin.
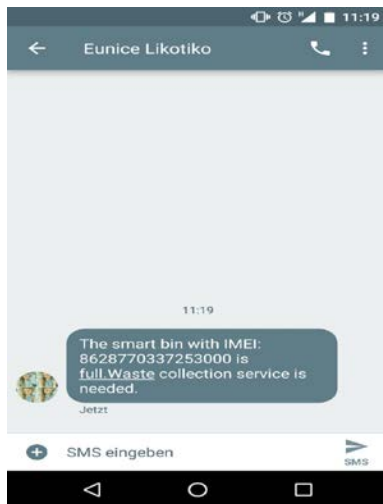
Figure 7. SMS notification
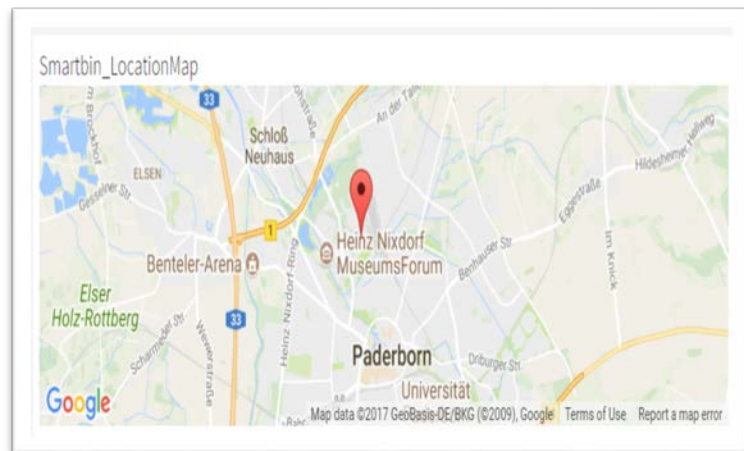
Figure 8. Sensor node location in a map

The developed web based interface Figure 9 was linked with the cloud platform Thinger.io for administrator to browse and retrieve monitoring information. The web also provided the interface for smart bin registration and storage of necessary information regarding smart bin such as *owner's category*, *Bin_id, first name, last name, location, email,* and *phone number*. The device IMEI from the GSM module and MAC ID from Wi-Fi module are unique and thus were used as *Bin_id* in the database for the administrator to identify the registered information of the smart bin during assignment of truck for waste collection.

Figure 9. Central system web based platform for smart bin

Ultrasonic ranger srf05 and VL53L0X Time of Flight distance sensor were also tested for the detection of different materials. The study selected materials in a consideration that were common known materials in generation of solid waste, such materials were; Paper, Glass, Polyurethane, Grasses (organic), Bubble wrap, Plastic, Nylon, and Aluminium foil, see Table 2. Both sensors detected the specified material at a time, difference of the sensor performance was observed. VL53L0X ToF sensor was extra sharp and very quickly to detect the even gesture of the material with it thin light source when light bounce back to the sensor in a fraction of second. Even though the sensor was not able to detect an obstacle far beyond 120 centimetres. On the other hand, Ultrasonic ranger srf05 detected material from a far up to 400 centimetres which is two-time maximum distance detection of the VL53L0X ToF sensor with high linearity from the obstacle distance. The triggered sensor sound wave took up to 25ms to make output level detection. The presented results are being useful for the selection of the right sensor for the development of the similar application.

Table 2: Sensors testing table

	Material	Results
1.	Paper	Detected
2.	Glass	Detected
3.	Polyurethane	Detected
4.	Grasses (organic)	Detected
5.	Bubble wrap	Detected
6.	Plastic	Detected
7.	Nylon	Detected
8.	Aluminium foil	Detected

Conclusion

In this work, an innovative three-layer architecture of real time solid waste bin monitoring system based on IoT has been designed and implemented. The system uses wireless sensor network and different communication technologies to monitor the solid waste bin status in real time. A notification is sent wherever the condition is reached and a smart bin location is shown on a map. The developed solution system can be used to reduce valued human resources like human effort, time and cost and improve the sustainability of the solid waste operations and obtaining green environment. Moreover, the study suggested some areas for extension such as waste collection route optimization, power optimization and actual implementation of the proposed architecture and prototypes.

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THE EVALUATION OF TURKEY'S TRANSPORTATION POLICY UNDER THE NATIONAL DEVELOPMENT PLANS

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Abstract: Transportation sector is one of the most fundamental sector supporting the economic and social development in the contemporary societies. Today, due to the planning of different transportation modes is not productive separately, it is agreed that different transportation modes need to be planned as combined and coordinated structure based on integrated approach.

The highway cargo and passenger transportations have the largest percentage in Turkey. Accordingly, the social, economic and ecological problems have been observed caused by single-mode transportation planning for many years. By the reason of Turkey located on the point where three continents converged, the country has geopolitical position. The transportation networks need to be determined by planning contemporary and environmentally friendly both national and international transportation corridors included. The transportation planning at the both national and international level has been intended to provide within the frame of the sustainable policies in Turkey. Therefore, the significant investments in transportation sector have been made in recent years.

In this study, the transportation policies from 1963 when the national development plans (NDP) began to be prepared to now are examined and evaluated. Then, it is analyzed how the policies related to transportation sector show an alteration and what is the factors affected the alteration in this process including all the NDPs in Turkey.

Keywords: Transportation, Transportation Policies, National Development Plan (NDP)

Introduction

In Turkey, the planning era has begun institutionally and constitutionally with Turkish Constitution of 1961. In the scope of ''Social and Economic Rights and Duties'', it is stated that ''It is the duty of the State to encourage economic, social and cultural development by democratic processes and for this purpose to enhance national savings to give priority to those investments which promote public welfare, and to draw up development projects.'' According to this article, the assignment of preparing national development plan has given to the institutional player of state. By founding State Planning Organization, it was targeted the financial, social and cultural development base on a plan could be provided. The NDPs and the programs related them comprise both macro and micro aims belonging to socio-economic sectors.

In this paper, it is comparatively examined the decisions taken in the planning era and current situation of the transportation sector that is determined by NDP in Turkey. Within this framework, firstly the development plans are evaluated in order according to the conditions of each plan period. Within the scope of each period, it is classified that the transportation policies and macro/micro aims in terms of all transportation subsectors (highway, railway, airway and seaway). In the sequel of this evaluation, it is discussed the transportation policies taken part in NDPs that is carried out according to the developments in practices. As the result of study, the NDPs are comparatively evaluated in the general framework.

Findings

The first three NDPs had been aimed in the long-term strategies including the objectives as a long-term targets for all sectors aimed at the first 15 years' achievement. This period was including The First NDP (1963-1967), The Second NDP (1968-1972) and The Third NDP (1973-1977).

By the reason of characteristic feature of transportation sector among all sectors, the qualitative and quantitative developments in this sector are pretty important for improving the quality of life and functioning of the other sectors. To the extent permitted by national economy, transportation policies in The First NDP base on this vision. Due to the sectoral developments are basis for the long term development, investments of the

fundamental sectors such as transportation, energy, education are given priority in the NDPs. The main objective of the policies of these sectors is to provide adequate production in terms of time and place, because of the importing the products belonging to these sectors isn't possible. Besides, it is determined that these sectors were planned to enable other sectors to provide targeted developments.

When the situation of the transportation sector in 1963 examined within the basic framework in terms of the subsectors, it is seen that physical standard was ineffectiveness and carrying system remained limited with main road network in highway. However, it had come first in terms of permanent facilities, line length and carrying capacity. In railway, due to the construction technique was quite outdated, ineffectiveness of physical standard could be observed clearly. Seaway came first in terms of vehicles, therefore the ports where all the products imported or exported provided 62,6 % of the total cargo handling. In airway, there were 26 functioning airports (two of them are international) included military ones. When the proposed investments for improving the sector are examined, it can be deduced that raising the standards of sector considered significant for perspective of the developing country. To provide targeted annual average of Gross National Product in the plan period, transportation sector achieved 13,7 % of all the investments including public and private investments.

Transportation policies in The First NDP designed to achieve long-term targets can be cited have a monopoly on the works for all transportation subsectors in order to get sectoral efficiency, utilize the current capacity by the optimal way by taking into consideration of the national economy, enhance of the services and reducing the costs between city centers and rural settlements, reduce the costs and use the railway or seaway for the remote distances. In addition, establish the organization of short-distance vehicle that is feeder of these transports. From a number of similarities between The First NDP and The Second NDP, it can be deduced Turkey's conditions had remained incapable to set the determination objectives in five years period. So, the policies of each period has been prepared for improving the condition of transportation sector in Turkey.

It had been planned that application process for EU membership which began with European Community Association Agreement signed on 12 September 1963, has existed legally since 1 December 1964 would come to the conclusion in 1995 and join the customs union. The NDPs from 1973 when The Third NDP entered into force to now have been planned to have the strategies for the objective to get EU standards. Therefore, the 15 years' achievement adopted in 1962 had not been completed in the direction of determined target, because of the decision for preparing Third one and subsequent NDPs to that according to the principles of the EU. In the process of harmonization with EU, all the transportation policies also ones regarding sub-sectors and infrastructure need to be harmonized as well.

When the rates of implementation of the policies are evaluated, it has been seen that most political objectives are taken place again in subsequent plan due to Turkey's conditions of plan period are insufficient to implement macro aims in terms of technological, economic, etc. aspects. As a main indicator of this condition it can be stated the development in accordance with the expectation and policies couldn't be provided and the monopoly of highway passenger and cargo transportation has been continued during the planning era, however the rational objectives and principles taking place in the First NDP such as having a monopoly of transportation policies which were previously carried out under no system; in order to ensure transportation activities in the framework of economic boundaries, seaway and railway transport will be encouraged for remote transports; by working off the unfair competition among subsectors, using the vehicles effectively for the benefit of national economy have been seen in the subsequent NDPs too. The economic structure and traffic density of Turkey has been begun to shape with basic lines since 1960s. Giving priority to highway transportation is the main policy in this period, so the developments of other transportation options has remained limited. Besides, there is no policy for increasing in the length of the existing railway network (Table 1, Table 2). The State has been granted the highway infrastructure investments in increasingly growing amounts over the years in comparison with the railway despite increasing of petrol costs.

In the Seventh NDP, as the reason of this situation given above, it is stated that there were no Transportation Master Plan suitable with the investments of the other sectors. Because of that, the developments of the sector has been influenced negatively. The works about the Transportation Master Plan Strategy aiming to solve these problems that began in 1996 were completed in 2005.

In the scope of the privatization programs, Build Operate Transfer (BOT) model taken place first in the Seventh NDP is implemented to realize the investments and develop the inspection mechanisms.

Within the EU harmonization process, it is seen that the certain principles regarding environment have been taken place since the Third NDP. In this process, the transportation policies suitable with the EU acquis is given importance in the Sixth NDP for the first time. It has been targeted the transportation infrastructure suitable with the environmental issues since the Seventh NDP, therefore the environmental issues has been taken place in the transportation policies. Besides, Environmental Impact Assessment Process (EIA) taken place in the Fifth NDP for the first time, has been implemented for the transportation investments since the seventh NDP.

Since the Eighth NDP, the policies for providing the opportunities related advantages of Turkey's geographic location has been prepared. it is stated that in the NDPs, by determining international transport network to provide to trough transport arteries between Europe and Asia, to combine transportation enhances all the type of transports, to integrate the TEN-T (Trans Europe Transportation Networks) of EU with Turkey, to empower the projects of arteries among Caucasian, Central Asia and Middle East Countries and Turkey. In this scope, it is expected that the gained status of ''International Transportation Through Road'' will accelerate the development.

The Ninth NDP was prepared with the vision of "Turkey, a country of information society, growing in stability, sharing more equitably, globally competitive and fully completed her coherence with the European Union" as well as within the framework of the Long Term Strategy (2001-2023). After General Directorate of Highways and Under secretariat for Maritime Affairs became the sub unit of the Ministry of Transport and Communication, the institutes regarding transportation in Turkey have been gathered under a single roof in 2007.

When the Tenth Development Plan covering the 2014-2018 period examined, it is seen that priority is given to transportation systems that provide energy efficiency, use of clean fuel and environment friendly vehicles. It is emphasized that efforts to connect international and domestic production and consumption centers by improving the transportation infrastructure and to integrate transportation modes to each other have been continued during the Plan period. In this context, projects that strengthen the connections to the Trans-European Transport Networks (TEN-T), Caucasia and Middle East have been realized to a significant extent, construction of dual-carriage ways have been continued, high-speed railways have started operation, two main container ports have been given priority, and the number of domestic and international passengers and frequency of flights in the aviation sector have been increased.

As the primary targets in Regional Development of this plan, along the north-south corridors, transportation infrastructure connecting metropolitan cities, production centers and tourism cities will be reinforced. Regional airline operation between the cities which have appropriate infrastructure will be encouraged in order to increase accessibility of these cities and to reduce incurred expenses in connecting flights over Ankara and İstanbul. Connections of ports to Central and Eastern Anatolia and the GAP region will be strengthened. Besides, strengthening links between production and service centers and ports, organizing production more efficiently, improving and extending railroad infrastructure for freight shipment, increasing interaction among regions and enhancing accessibility especially along the north-south corridors by considering attraction centers and growth poles, maintain their significance. It is taken place that Logistics Master Plan integrated with transportation modes and corridors, logistics centers and other logistics activities will be prepared and put into practice. Within this framework, transport corridor maps showing transport alternatives of Turkey will be prepared so as to be used as a guide for selection of logistics center locations. The developments and targets in logistic and transportation is given at table 3.

Table 1. Developments in transportation sector in terms of passenger transport

Domestic Lines	Passenger Transport (million pass-km)						
	Highway		Railway		Seaway		Airway
	Interurban	Innercity	Interurban	Innercity	Interurban	Innercity	Interurban
1963	19369	1184	3005	626	213	965	124
1967	36100	1045	3639	710	178	1025	203
1972	47365	1325	2911	1300	387	1600	512
1977	82141	-	2362	-	241	-	1073,4
1983	76864 (S)	-	3024	-	98	-	650
1988	93237	-	3082	-	189	-	1012
1994	127948	-	3881	-	50	-	2278
1999	189882	-	4233	-	34	-	3371
2006	188000	-	-	-	62	-	-
2012	259000	-	-	-	131	-	-
2013	276000	-	-	-	151	-	-
2018	321000	-	-	-	232	-	-

(S) The data of the state in the sector only

Table 2. Developments in transport sector in terms of freight transport

Domestic Lines	Freight Transport (million tones-km)				
	Highway	Railway	Seaway		Airway
	Interurban	Interurban	Interurban	Innercity	Interurban
1963	6717	4111	1889	65	1,1
1967	12500	6201	3420	80	2,4
1972	17714	6739	2948	42	2,4
1977	35100	10215	4397,2	-	83,9
1983	41812	6123	2930	-	57
1988	55225	6005	9730	-	100
1994	86382	8050	595 (S)	-	213
1999	155254	8160	8200	-	356
2006	177000	9600	3900	-	-
2012	216000	10900	7200	-	-
2013	232000	124000	8100	-	-

(S) The data of the state in the sector only

Table 3. The developments and targets in logistic and transportation

	The developments and targets in logistic and transportation	2006	2012	2013	2018	Annual Change Approx. (2014-2018)
HIGHWAY	Traffic (billion vehicle-km)	65	94	98	119	4
	Passenger transportation (billion passenger-km)	188	259	276	321	3,1
	Freight transportation (billion tones-km)	177	216	232	294	4,9
	Lenght of Roads (km-1000 km^2)	82	83	84	87	0,7
	Intensity of highways networks (km/1000 km^2)	2,60	2,88	2,85	5,11	12,1
RAILWAY	Freight transportation (billion net tones-km)	9,6	10,9	12,4	22,5	12,7
	The percentage of railway in freight transportation (%)	5,1	4,8	5,1	7,1	6,8
SEAWAY	Container (million TEU)	3,9	7,2	8,1	13,8	11,2
	Cargo handling (million tones)	248	388	418	615	8,0
	Merchant Marine Fleet with Turkish flag (million DWT)	7,3	10,3	11,0	14,0	4,9
AIRWAY	Number of passenger (million passenger)	62	131	151	232	9,0

Conclusion

The national development plan on a territorial scale is the socio-economic plan leading spatial plans. Actually, it is expected that national development plans provide to develop the sectors affected by development of countries. The context of development plans and process of preparation and application change from country to country. Level of development of countries, geographical location and expectation of public affect the sectoral plan decisions. The fundamental planning criteria determined by the environmental and ecological issues depending on the recent global approach has influenced context of plans. Besides, the usage and protection of the local resources for determining the targets of economic sectors is the one of the determinative issues especially for the developing countries.

In this paper, it is examined the transportation policies in national development plans. When especially the

context of the latest three plans is taken into consideration, policies are tried to prepare in accordance with the issues stated above. It can be set a good example that the sizable transportation investments in all transportation modes planned for the main transportation networks connected the continents. Since the planning era began in 1961, one of the most critical approach is reducing the share of railway transportation which has an important share of transportation and logistics every passing year until 1990s. As a result of highway transportation is highly demanded, environmental and economic problems has accompanied this preference. However, the environmentally friendly transportation options are emphasized in each plans, it is not applied in practice as stated in the plans. When the plans are taken into consideration, it is seen that two issues come into prominence. Firstly, the plans need to be ongoing structure; the policies need to be consistently prepared according to the fundamental criteria based on environmental, economic and national issues. The other important issue is, the institutional, constitutional and directorial issues need to be empowered in accordance with the decisions on policies stated in plans.

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THE INVESTIGATION OF SOCIAL PROBLEM SOLVING ABILITIES OF MOTHERS WITH PHYSICALLY DISABLED CHILDREN BY THE USE OF QUASI-EXPERIMENTAL METHOD

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Abstract: This research is an empirical study aims to develop social problem solving skills of mothers with physical disabilities (cerebral palsy and muscular dystrophy). The study group consist of 30 mothers whose children receive physical treatment in a private rehabilitation center in Kayseri. As a preliminary test, 'Social Problem Solving Inventory Short Form' and general information form were administrated to the study group. Out of 30 participants randomly selected 15 people formed the experiment group and 15 people formed the control group.

Based on the Social Problem Solving Therapy principles, the training program with a psycho-educational content, the cognitive behavioral therapy and including stated and moving games were used in the experimental group for 5 weeks. No training was given to the control group in this process.

When the variables were examined in an integrated way, a significant difference ($p < 0,05$) was observed between the total score of the experiment group after training given to them and their pre-training total score. It can be argued that the education given to the mothers is effective in improving their social problem solving skills.

Key words: Social Problem Solving, Physical Disability, Mother's Education, Rehabilitation Center.

Introduction

As physically handicapped baby enters the family, many problems begin to reflect on the family. Failures in the process of solving problems can cause the balance of the family to be disrupted. Successful resolution of the problems effects the family communication, family unity and psychology of parents and children in a positive way.

Parents of physically disable children have difficulties in daily living. This may cause escaping from society and alienation. Families think that others can not understand them and the ability to communicate with others is deteriorated. Problems such as weakness, insecurity, meaninglessness and value conflicts are at the forefront of families with disabled children and this presents a serious problem for them (Izgar, 2009).

Mothers who are under the obligation to look after the disabled child should be educated for not lowering their quality of life, not catching burnout syndrome and due to the difficulties in life they should be provided with psychological support. Information and support about the treatment and rehabilitation of children with physical

disabilities will also reinforce self-confidence of the mother's and it encourages them in looking after their children (Karataş, 2001).

 This experimental study was conducted to investigate whether the Social Problem Solving Skills Training has a positive effect on the problem-solving skills of the mothers with physically disabled children and whether this effect is permanent.

Aim of the Study

The overall objective of the study was to determine the problem solving levels of the mothers with physically disabled children and the effects of the Social Problem Solving Training based on the Five-Step Approach Model for Solving Social Problems given to mothers' through group experience, and decrease the mothers' Impulsivity/Carelessness Styleand Avoidance Style Problem Solving Abilities.

Sub-objectives for his general purpose were:

1:Determining the social problem solving styles and problem orientations of the mothers participating in the research.

2: Decreasing the scores of mothers' ineffective Impulsive Careless Style Problem Solving and Avoidance Style Problem Solving and increasing their Rational Problem Solving scores

3: Sustaining the positive problem solving behavior

Method

The study is a quasi-experimental study with single experimental and control group.

Study Group

Mothers who reside in Kayseri, who has physically disabled children and who send their physically disabled children to a private rehabilitation center for physiotherapy form the study group of the research. In the study, the criteria used to select the experimental and control group was; being literate having a child with physical disability and residing in Kayseri.Taken these criteria as a base 30 voluntary mothers were selected and they were randomly attended into experimental and control group.

Data Collection Instruments

In the study, mothers were given the Personal Information Form and the Social Problem Solving Inventory Short Form (Çekici,2009). The Personal Information Form contained the demographic characteristics and basic family information of the mothers in both groups.

The Social Problem Solving Inventory was developed by D'Zurilla and Nezu (1982) and it was reviewed by D'Zurilla, Nezu and Maydeu-Olivares (1996) and it was adapted into Turkish by Dora (2003). In this study, the researcher used the Social Problem Solving Short Form that was adapted by Çekici (2009)

The Social Problem Solving Inventory Short Form (SPCE-KF) consists of 2 dimensions as Problem Orientation and Problem Solving Styles. Within the Short Form, Problem Orientation has 2 subscales; beingPositive and Negative Orientationstowards the Problem. Problem Solving Styles are divided into 3 sub-scales, being Rational Style Problem Solving, Impulsive/Careless Style Problem Solving, and Avoiding Style Problem Solving.

The lowest score that can be obtained is 0 and the highest score is 100.High score indicates positive social problem solving skillsand low scores indicate negative social problem solving skills (Çekici, 2009).

Application

 Personal Information Form and Social Problem Solving Short Form were applied to all of the mothers selected for the study group. Then mothers in the experimental group were given training for 5 weeks with 2-2.5 hours

duration. The control group did not receive any treatment. Posttest was administrated to both groups and a follow up measurement was administrated 6 weeks later.

Data Analysis

SPSS 22 statistics packaged software was used to analyze the data. In descriptive statistics analysis of the data, standard deviation, median, the minimum and maximum frequencies and ratio values were used. The distribution of the variables is measured by the Kolmogorov Simirnov Test, which is used to test whether a theoretical population with two different experimental probability distributions comes from the probability distribution. In the analysis of the repeated measurements, the Wilcoxon Test developed to test whether the distribution of two variables is the same in experimental studies was used.

Psycho-education Group Training

Mothers participating in this social problem solving skills training were trained for 2 to 2.5 hours on average, once per week for 5 weeks. In this study, no training was given to thecontrol group.

Training program was based on the Problem Solving Therapy (PST; D Zurilla and Goldfried, 1971), which is a systematized approach based on the Cognitive-Behavioral Therapy(CIS) techniques such as ABC teaching, self-monitoring, though stopping, working on the irrational thoughts, cognitive restructuring, giving cognitive and behavioral homeworks, being a model, supportive, directive and indirective interventions, rewarding, humour, exercises based on action and music, table games exercises, small group works were used during the sessions.

Results

Table 1. Mothers' Demographic Characteristics Table

		Experimental G.		Control Grup		p
		n	%	n	%	
Age	26-32	3	20,0%	5	33,3%	p> 0.05
	33-40	5	33,3%	4	26,7%	
	41-47	6	40,0%	3	20,0%	
	48-55	1	6,7%	3	20,0%	
Education	Literate	1	6,7%	1	6,7%	p> 0.05
	Primary sch	10	66,7%	9	60,0%	
	High School	4	26,7%	5	33,3%	
N. of Children	II	6	40,0%	8	53,3%	p> 0.05
	III	5	33,3%	5	33,3%	
	IV	4	26,7%	2	13,3%	
Fathers' education	Primary sch	5	33,3%	7	46,7%	p> 0.05
	Mid. Sch.	3	20,0%	7	46,7%	
	High School	7	46,7%	1	6,7%	
Disabilitiy Children N.	I	12	80,0%	12	80,0%	p> 0.05
	II	3	20,0%	3	20,0%	
Fathers Income	Var	13	86,7%	13	86,7%	p> 0.05
	Yok	2	13,3%	2	13,3%	
Occupation	employed	0	0,0%	0	0,0%	p> 0.05
	unemployed	15	100,0%	15	100,0%	
Family Income	low	1	6,7%	6	40,0%	p> 0.05
	medium	13	86,7%	8	53,3%	
	high	1	6,7%	1	6,7%	
School Attandance	yes	8	53,3%	8	53,3%	p> 0.05
	no	7	46,7%	7	46,7%	

Ki-kare test

As seen on the Table 1., nearly half of the participants of the experimental group (% 40) are at the age range of 41-47. The vast majority of participants of the experimental group (% 66,7) graduated from primary school; 40 % of the experimental group have 2 children, 33,3 % of them have 3 and 26,7 % of them have four children. In

the experimental group, 80 % of the mothers have one disabled child and 20 % of them have two disabled children. All of the mothers in the experimental group are not working and almost all of them have medium family income. It was also seen that 33 % of the participants of control group are at the 26-32, 26.7 % of them are at the 33-40, 20.0 % of them are 41-47 and 20 % of them are at the 48-55 age range. The vast majority of control group (%66,7) graduated from primary school. None of the participants of the control group are working like experimental group. Forthy percent of participants in control group describe their family income as low, 53.3 of them describe it as medium and 6.7 % of them describe it as high level. In both of two groups, experimental and control, 53 % of the participants' children with disabilities is receiving education and 46 % of them are not receiving regular school education.

Table 2: Experimental Group Pre-Training - Post Training Data – Follow up Data Analysis Table

Sub Scale	Min-Max	Med.	Mean.±s.s.	pre test	post test
Positive Problem Orientation					
Pre-Test	2 - 15	8,0	7,5 ± 4,1		
Post Test	9 - 19	16,0	15,1 ± 2,8	0,001	
Follow up test	7 - 20	17,0	15,3 ± 3,8	0,001	0,724
Negative Problem Orientation					
Pre test	10 - 16	15,0	14,0 ± 2,2		
Post test	0 - 12	5,0	5,3 ± 3,6	0,001	
Follow up test	0 - 14	5,0	5,0 ± 3,3	0,001	0,647
Rational Problem Solving					
Pre test	0 - 13	8,0	8,1 ± 3,6		
Post test	6 - 19	13,0	14,0 ± 3,3	0,001	
Follow up test	5 - 19	14,0	13,4 ± 3,9	0,001	0,329
Careless Impulsive P.S					
Pre test	0 - 17	13,0	10,3 ± 6,1		
Post Test	0 - 11	2,0	3,8 ± 3,7	0,003	
Follow up test	0 - 12	5,0	4,9 ± 3,7	0,006	0,108
Avoiding Problem Solving					
Pre test	1 - 17	8,0	8,9 ± 5,5		
Post Test	0 - 9	2,0	2,7 ± 2,4	0,002	
Follow up test	0 - 8	3,0	3,7 ± 2,9	0,006	0,106
Total					
Pre test	32 - 77	40,0	44,6 ± 12,6		
Post Test	56 - 92	79,0	77,3 ± 10,8	0,001	
Follow up test	54 - 92	80,0	75,1 ± 12,6	0,001	0,255

Wilcoxon test

As seen on the Table 2., the Positive Problem Solving Orientation factor variable had a significant difference in the positive direction ($p < 0,05$) in the post test values.

As for the positive problem solving orientation scores, there is a significant difference ($p < 0,05$) between the follow-up scores and pre-test values, but not a significant difference ($p > 0,05$) between the follow-up and post-test scores.

For negative problem solving orientation scores, post-trainnig scores decreased significantly ($p < 0,05$) as compared to the pre-test scores.

When the negative problem orientation's follow up score is compared with the pre-test score, a significant difference (p < 0,05) is observed but there is not a significant difference (p > 0,05) between the follow up and post-test values.

In the rational problem solving factor, it was observed that the post-training score, test values for rational problem solving factor has increased significantly. Follow up scores showed a consistency.Careless Impulsive Problem Solving values also decreased as post test values show and also follow up values show a constancy.Avoiding style problem solving scores were also significantly decreased as post test values have shown. Additionally, follow up values show a constancy of change.

The same pattern was also observed for the total score comparison.

Table 3. Control Group Pre-Training - Post-Monitoring Data Analysis Table

Sub Scale	Min-Max	Median	Ort.±s.s	Eğitim Öncesine Göre Değişim p
Positive Problem Orientation				
Pre Test	2,0-11,0	8,0	7,5±2,6	
Post Test	0,00-10,0	7,0	6,8±3,1	0,068
Negative Problem Orientation				
Pre Test	2,0-19,0	12,0	12,3±5,2	
Post Test	3,0-20,0	12,0	12,8±5,6	0,138
Rational Problem Solving				
Pre Test	2,0-11,0	8,0	6,8±3,3	
Post Test	2,0-11,0	6,0	6,7±3,3	0,539
Careless-Impulsive P.S.				
Pre Test	4,0-18,0	13,0	11,2±5,0	
Post Test	3,0-18,0	11,0	10,5±5,4	0,085
Avoiding Problem Solving				
Pre Test	0,00-20,0	6,0	9,2±7,6	
Post Test	0,00-20,0	6,0	9,3±7,7	0,053
Total				
Pre Test	21,0-52,0	43,0	41,6±8,8	
Post Test	18,0-53,0	42,0	40,4±9,9	0,066
Wilcoxon test				

As seen on the Table 3., control group's pre and post test scores did not revail any significant difference.

Results and Discussion

To sum up, there is a significant increase in the experimental group's' positive orientationtowards 'problems'and a significant decrease in their negative orientation towards problems. The consistency of the positive effect in the problem solving orientation of the participants is observed in the follow up values.

In the control group, as was predicted there is not any significant positive or negative change in the orientation of the participants who did not receive training. The main obstacle, which makes it difficult for the participants to solve their problems and see their problems rationally, the participants have is their negative feeling situations and negative orientation towards problems. In the process of problem solving, emotions need to be governed because negative feelings make problem solving difficult. Therefore, it is suggested that the individuals should be thought to govern their feelings through intervention programs (D'Zurilla ve Nezu, 2007).

The program was planned to make the participants recognize their negative emotional situations and change them and to develop positive attitudes, activities such as playing various games, written exercises, making experiential sharing by participating in small groups and they were given homework and then they were required

to submit these assignments.The post-test values showed that the negative orientations of the mothers against the problem decreased significantly and their positive orientations towards the problem increased respectively.

Also mothers' Ineffective Careless-Impulsive Style Problem Solving and Avoiding Style Problem Solving Skills scores decreased significantly. In the experimental group, it was also observed that the scores of Rational Style Problem Solving skills, which are the positive style problem solving skills of mothers, increased significantly and remained persistent after 6 weeks in follow-up studies. In the final test scores of the control group, it was observed that there was no change or improvement in the negative style problem solving skills of the untrained mothers.

These research results are in accordance with the literature (Çekici 2009, Söylemez 2002, Yıldız 2003, Canel 2007). Therefore results are supported significantly: For example studies by Çekici and Söylemez revealed similar outcomes in their experimental studies.

When the social problem-solving skills development training researches (Heppner and Peterson, 1982; Gommon and Roze, 1991; Chinaveh, 2010) conducted abroad are evaluated, it is seen that the results obtained in these studies are similar to our research findings and support the findings of our study.

The research conducted by Yıldız (2003) was aimed to train the experimental group being mothers of preschool children for problem solving, decision making, conflict resolution and effective communication skills. Results of the study reveal similar results with the present study.

Canel's (2007) study which was done with couple's also revealed similar results same as the present study.Alsoa group of problem solving skills training researches done by numerous researchers (Heppner and Peterson, 1982; Gommon and Roze, 1991; Chinaveh, 2010) revealed similar outcomes.

Suggestions

In general problem solving skills training seems to be effective for different populations. Therefore this sort of training can be suggested for different groups of mothers and fathers such as those having mental, hearing and visually disable offspring.

Another suggestion can be to have training programs for some other negative emotions such as anger, failure in conflict resolution and such.Also similar trainings can be given to husbands,fathers and siblings of disabled children.

A 'trainer education program' can be developed for social problem solving skills for parents,siblings and other related groups.

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