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Editorial

Dear authors, reviewers, and readers

It has been a month since I was given the privilege to serve as the Chief Editor of the International Journal for Innovation Education and Research (IJIER). It is a great pleasure for me to shoulder this duty and to welcome you to ***THE VOL-3, ISSUE-10 of IJIER*** which is scheduled to be published on **31st October 2015.**

International Journal for Innovation Education and Research (IJIER) is an open access, peer-reviewed and refereed multidisciplinary journal which is published by the International Educative Research Foundation and Publisher (IERFP). IJIER aims to promote academic interchange and attempts to sustain a closer cooperation among academics, researchers, policy makers and practitioners from a wide range of disciplines, which contribute to state of the art in science, education, and humanities. It provides a forum for the exchange of information in the fields mentioned above by welcoming original research papers, survey papers, and work-in-progress reports on promising developments, case studies, and best practice papers. The journal will continue to publish high-quality papers and will also ensure that the published papers achieve broad international credibility.

The Chief Editor, appointed by the Associate Editors and the Editorial Board, is in charge for every task for publication and other editorial issues related to the Journal. All submitted manuscripts are first screensed by the editorial board. Those papers judged by the editors to be of insufficient general interest or otherwise inappropriate are rejected promptly without external review. Those papers that seem most likely to meet our editorial criteria are sent to experts for formal review, typically to one reviewer, but sometimes more if special advice is needed. The chief editor and the editors then make a decision based on the reviewers' advice.

We wish to encourage more contributions from the scientific community to ensure a continued success of the journal. We also welcome comments and suggestions that could improve the quality of the journal.

I would like to express my gratitude to all members of the editorial board for their courageous attempt, to authors and readers who have supported the journal and to those who are going to be with us on our journey to the journal to the higher level.

Thanks,

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Developing Reading Skills Using Sight Word Reading Strategy through Interactive Mobile Game-Based Learning for Dyslexic Children

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Abstract

Reading skill is crucial in our daily activities. On the other hand, there are some people who experience difficulties in reading. This is due to the way they see things are different than normal people. This learning disability is known as dyslexia. The symptoms started from young. Children with dyslexia use all of their senses to interact with their surroundings. They are easily attracted to pictures rather than words and are highly imaginative. In this project, a mobile application to help children with dyslexia to develop reading skills is proposed. This paper will discuss about the development of the mobile application. The methodology used in this project will be discussed along with the implementation and testing. The results have shown that respondents gave positive feedbacks prove that the application is effective in developing reading and spelling among dyslexic children. Lastly, limitations, future works and conclusion of the overall project will be discussed. The mobile application is named as "Mr Read".

1. Introduction

Dyslexia is a referring term for learning disabilities within reading, writing and spelling. Children with dyslexia use all of their senses to interact with their surroundings. They are easily attracted to pictures rather than words and are highly imaginative. A good reading skill is gained from the ability to recognize words and decoding the word [1]. Children begin to read by recognizing the whole words and later gradually become aware of the relationship between the letters and sounds presented. There are various approaches to develop a reading success for dyslexic children including repeated reading, sight word drills, development of vocabulary and semantics, and increase speed of processing letter and syllable pattern. Sight words provide an excellent foundation for reading as the higher frequency of child see the word the more they able to recognize and understand the meaning of the word as a whole. Nowadays, technologies such as smartphones and tablets have become our necessity to improve our life style. Therefore, in this project, mobile game-based learning applications will be develop for children with dyslexia to help improve their educational learning. By using mobile devices, they can access the lessons easily and practice at anywhere they want. Implementation of multimedia elements will be integrated into the application to make the learning environment become more attractive and interactive for this group of children.

1.1 Problem Statement

1.1.1. Dyslexic children having problem in expressing their feelings or ideas both orally and writing.

One of the challenges faced by dyslexic children is their difficulties in expressing their feelings or ideas both orally and writing. This is due to the lack of vocabulary growth, causing problem in recognizing letters, sound and meaning of the word as a whole. Children who were diagnosed with dyslexia are referred as an individual

that suffer a condition of word blindness [3]. This means that when a child is seen to spell word wrongly, this indicates that the child suffers a condition of dyslexia.

1.1.2 Dyslexic children who experience learning difficulty also have low self-confidence.

The learning development of dyslexic children is slower than the normal children do causing them to hardly understand and catching up the lessons in class. When there are given tasks, they tend to do a lot of mistakes in the tasks because they do not understand the question. In addition, they are too shy to ask questions to instructor. If this situation continues, they might give up on learning especially in reading. If they receive appropriate resources and support, they are able to blend into their circle of friends and subsequently enhance their inner self.

1.1.3 Reading application that is specially developed for dyslexia is limited

There are still quite a few applications that are specially developed for dyslexic children. Current mobile applications for dyslexia are mostly based on phonics awareness approach and sight words flash cards to teach basic reading. In addition, story-based application does exist in current mobile application store. However some of the features are not suitable for dyslexics. For example the use of font type and background color is not suitable for dyslexics. The solution proposed in this project is by improving their reading skills using sight word reading strategy. In attempt to help dyslexic children to gain their learning spirit and improve their vocabulary as part of their reading development, sight word strategy is use in a fun context through different reading platform. In this project, short story, rhyme and song lyric will be applied.

2. Literature Review

2.1 Sight words and dyslexia

Sight word reading is particularly important for reading English because one-third of written English words such as yacht and great do not follow the letter sound rules, thus, these words have to be learned by sight [4]. Children build up their sight words vocabulary starting from kindergarten. Each stage has a number of sight word lists that are to be memorized and recognized by children. As the children grow, the level of difficulty in terms of syllables and number of words will increase.

Students with learning disabilities and dyslexia are better using sight word since beginning to improve their ability to recognize words and this will likely help him or her with the overall reading speed, accuracy and comprehension [5]. When readers able to recognize words by sight, this will increase their overall reading comprehension as they develop a word bank and their meanings that helps them to understand other words in sentences context [5]. Learning sight words also enhances spelling skills. There are two lists of commonly used high-frequency sight words that are taught to new readers; The Dolch List and Edward Fry List.

In this project, the target age of dyslexic children is from 7 to 9 years old, which in grade 1 and 2. This project will be using Dolch List of Basic Words for grade one and grade two children. Dolch list is widely used and was created in 1936 by William Edward Dolch. It comprises words that need to be easily recognized to achieve fluency in reading. Many of these words cannot be learnt by using pictures or sounded out using phonics. This leads to the term sight words.

2.2 Proposed Solution

Current sight word applications mostly implement direct sight words and games such as flashcards and memory games. There is still limited number of application that features sight word in form of story-based or comprehension approach for dyslexics. Therefore, this project will implement sight words into three types of reading platforms, through short story, rhyme and song lyric. These reading platforms contain a controlled vocabulary set, using the most frequent words encountered in print. The stories will reinforce sight words in sentences rather than in isolation.

Meanwhile the games will test the dyslexics' understanding upon the previous reading in fun environment. Reinforcing sight words in sentences ensures them to make a meaningful association with each word and they are more readily to commit the words in memory. Dyslexic children can read sight words which will be highlighted within the text while enjoying the reading. Each sight words will come with audio to promote spelling and practice read aloud. The Auto Read feature can be enabled or disabled. This feature is to model fluent reading and can be disabled once the user able to read independently. The different reading platforms will give dyslexic children variety learning approach to develop reading skill other than phonics awareness and traditional flashcards, which are very common nowadays.

Proposed features that will be implemented into the project:

i. Tap each word on a page to help struggling readers listen back the word
ii. Offers spelling of the sight word
iii. Vocabulary controlled stories
iv. Uses OpenDyslexic font type, which is specially designed for dyslexics

1) Sight word through short story

The feature will be using a short story with narration. User also can tap to any of the sight word on the page to help struggling user to hear and pronounce the word. The short story use will be a vocabulary controlled story.

2) Sight word through rhyme

The feature will be highlighting the words line by line during reading the rhyme. Rhyme can teach word families as rhyming words end with the same group of letters [6]. Rhyme helps students learn common spelling patterns, where once student can read the word cat; it is far easier for them to read mat, sat, rat, and bat [7]. Teaching base words and common prefixes and suffixes give students the skills they need to analyze word parts and decode unfamiliar words independently [7].

3) Sight word through song lyric

The feature will be a song that can be sing along and user able to play or stop the song.

3. Methodology

In this project, mobile game-based learning (mGBL) Engineering Model based on the proposed model by Shiratuddin and Zaibon [2] is chosen to develop the mobile application. The major reason this model is chosen because it includes learning content design and development. Other than that, mGBL Engineering model encourage game level and storyboard. Moreover, this methodology also suitable for this project as the phases can be customized according to the project needs.

Figure 1 shows the process of mGBL Engineering Model. The model consists of phases, components, activities and deliverables. The model is divided into two layers. First layer is general phases: pre-production,

production and post-production. The second layer is the components. When the current phase is approved, the next phase can be proceeded.

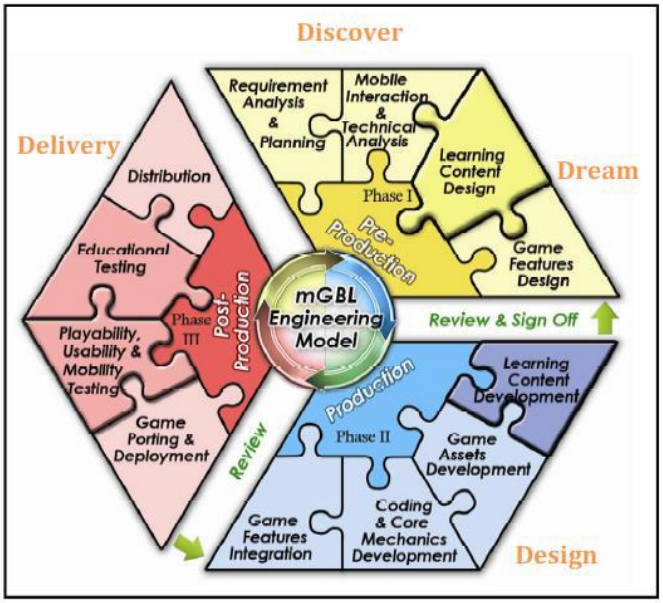

Figure 1. mGBL Engineering Model

3.1 Phase I: Pre-Production

Start with a clear statement of the definition of the project. Then, determine the project concept that covers the scope and how the project does relate to the overall curriculum. Specifications of tools that will be used to develop this application will be determined in this phase. The requirements analysis is defined through the research over the existing systems and online resources related to this project. In addition, collection of data will be using questionnaires, observation and interview techniques to get some ideas from target user before developing the project.

Then, design specifications of the project 'look and feel' will be done. There are three designs come up in this phase. First, mobile interaction and analysis is the workflow that visualizes the sequence of the navigation upon the application. Lastly, game features will be designed. The process starts with the learning content design and followed by workflow and storyboard.

3.2 Phase II: Production

In this phase, the prototype will be developed according to what has been planned from the previous phase. These include learning content, coding and core mechanics development. Then the game features will be integrated. The production of the design includes using digital media such as graphics, text, animation, animation and audio.

3.3 Phase III: Post-Production

The final phase will be the deployment of the prototype. Evaluation will be done based on its functionality, usability and mobility testing. The prototype will be tested with a sample of students and teachers within a period of time. Questionnaire will be given for feedback. Based on the feedback received from the respondents, the prototype will be reviewed and some changes will be done to improve the product functionality. Lastly, a finalized documentation will be submitted and with the final product.

4. Requirement Analysis

4.1 System Requirements

Figure 2 shows the minimum requirements for hardware and software that use to develop the mobile application.

Component	Description
Model Name	Acer Aspire 4750G
Central Processing Unit (CPU)	Intel Core i5-2410M (2.30GHz Processor with Turbo Boost up to 2.90GHz DDR3 1333Mhz 35W, supporting Intel 64 architecture, Intel smart Cache)
Operating System (OS)	Windows 7 Service Pack 1
Random Access Memory (RAM)	2 GB DDR3
Graphics Processing Unit (GPU)	NVIDIA GeForce 520GB
Hard disk Capacity (GB)	500 GB
Display	14.0 inch, 16:9, 1366x768 pixels

Figure 2. Hardware requiremnts

There are three software are required to develop Mr. Read. The first one is Android Studio software to write the full coding of the Android application. This software requires JAVA SE Development Kit Version 7 (JDK7) plug in. JDK7 plug in is used to installed the appropriate API version for the application. The application can only be run or debug in Android Studio by installing the correct API. In this project, the target android platform is Android version 4.2.2. Therefore, API version 17 is used. The language use to develop the application is Java language.

Microsoft Paint and Adobe Photoshop CS6 are used for designing and editing the graphics of Mr Read application. Adobe Media Encoder is used to enhance the sound quality of recorded voice. RealPlayer Trimmer is used to trim the required sound. Smart Voice Recorder application is used to record voices for narration, instructions and sight word spelling. The target device for this project is only tablet. This is to ensure that the development can be focused on the functionality of the proposed features met with the proposed objectives. The medium of the application will be extended only after successfully developing all the features.

4.1.1 User Requirements

In order to gather the basic information of learning approaches used to teach student with learning disabilities, a research is conducted through the Internet, review on the existing applications, collection of questionnaires and interview, and observation. Reviews has been done on the existing application have been done to identify and compare the features that are commonly found in the current mobile application. The common features include the navigation flow, menu selection, text, audio, image and game. Consequently, these features can serve as references to design the user requirements for Mr. Read.

Next, a visit to the Dyslexia Association of Sarawak (DAS) has been done to get further information regarding this project. During the visit, questionnaires are distributed 10 participants, 5 of them are dyslexic students and another half is teachers at the center. Then, an interview has been conducted with one of the teachers and followed by observation to one of the student at the center.

4.1.2 Learning Content

In this project, learning content within Mr. Read is design to teach reading and spelling using sight word reading approach. This approach is incorporated into different reading platforms in this project; story, rhyme

and song. Moreover, the users are able to test their understanding by playing the educational game. The learning is going to be learner's centered.

4.1.3 Interaction Design

A good design helps user to navigate a system without stress. Since dyslexic children have difficulties in some aspects such as visuals, an effective user interaction design is designed for the Mr Read application. Therefore it is important to come up with a design that is useful and facilitate them through the learning process. Interaction design is closely related to user experience. The design is focused on the complex dialog between human and an interactive device, in this case, a mobile device. The interaction design is based on the guideline proposed by Aziz and Husni (2012). The guideline consists of three dimensions, namely, form, content, and behavior. The elements such as typography, color and layout are acquired from the requirement analysis findings and literature review.

Figure 3 illustrates the interaction design dimensions. The combination of three components namely form, content and behavior build up the interaction design.

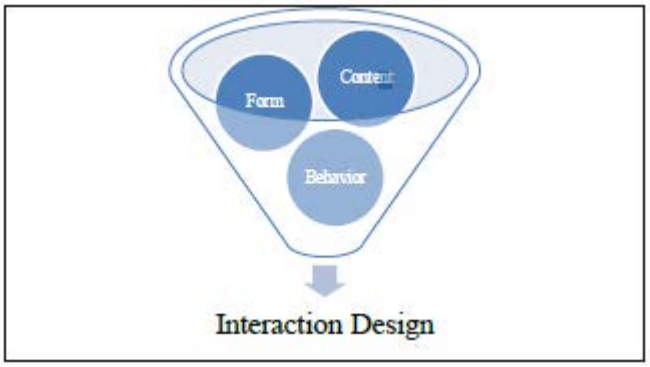

Figure 3. Interaction design dimensions

5. Application Testing

5.1 System Testing

System testing is an important process to ensure the system is performing well. There are two types of system testing that has been conducted.

5.2 Functionality Testing

Functionality testing is carried out to make sure that the proposed functions are working properly. Each function will be reviewed from any aspect to ensure its capability. Based on the table 4.2, most features are working as expected. This testing is carried out since beginning of the production until a satisfiable prototype achieved.

5.3 Usability testing

A usability testing was conducted at Dyslexia Association Sarawak. There are 8 respondents involved in the testing. The respondents consist of 7 teachers and a student. The respondents were given a tablet with Mr

Read installed to play and explore within an amount of time. After that, they were required to fill in the usability testing questionnaire. There are 10 questions provided.

Table 1. Usability Testing Questions

Mr Read is easy to use
Mr Read interface layout is clear and consistent.
Appropriate use of colors and images
Appropriate use of sound
All buttons in Mr Read are labelled clearly.
All the instructions are presented in simple language and easy to understand.
Mr Read can assist the user in reading
Mr Read encourages user to read more
Effectiveness in learning of sight words
Are you interested to download Mr Read in the future

5.4 Evaluation

Figure 4 – 7 shows the evaluations made based on the result in Table 1, which collected from 8 respondents.

5.4.1 Ease of use

Based on the Figure 4, 7 of 8 respondents strongly agreed that the application is easy to use. The high number of feedback of respondents stated the Mr Read application is easy to use proves that the application is easy to use. Besides, 7 out of 8 respondents also agree that all the instructions are presented in simple language and easy to understand. They can navigate the applications easily without much explanation. This is proved that the Mr Read is clear and understandable.

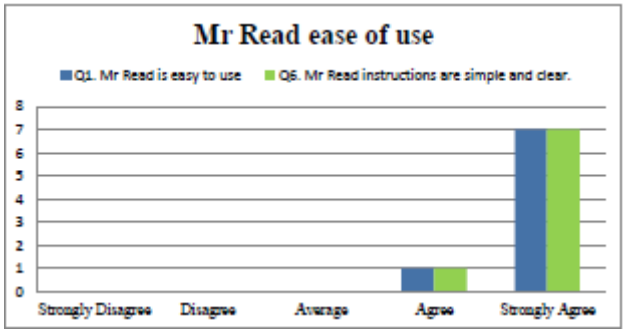

Figure 4. Interaction design dimensions

5.4.2 Interface and multimedia elements:

Figure 5 shows the result of Mr Read application interface and multimedia elements rating. Based on the result, 6 of the respondents are satisfied with the interface layout, color and image used. However, in Story module, two of the respondents stated that the background color has suppressed the texts. Thus, an adjustment has been made with color that is more soothing to the eye. As for the use of sound, based on the figure 1.10, 6 respondents have strongly agreed that the background sounds used are attractive and audio for instruction and narration are appropriate and clear. However, there were sometimes the audio buttons will be either overlapped, or crushed. This is due to the heavy background processing such as queueing the sound in order and loading data from interface components that involving big size images. This issue will be taken into priority to be fixed in the future works as to improve the functionality of this application. Figure 5 also showed that 6 of 8 respondents strongly agreed that the labels on the buttons are simple and clear.

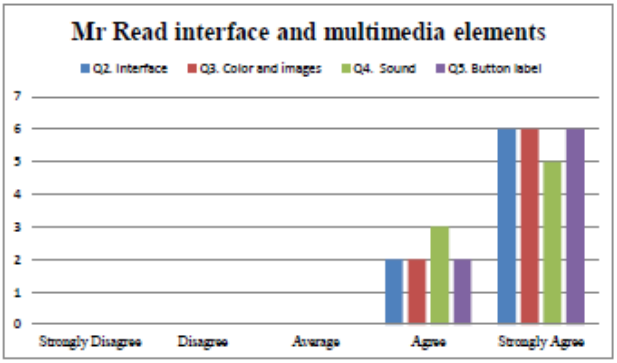

Figure 5. Mr Read interface and multimedia elements

5.4.3 Efficiency in learning:

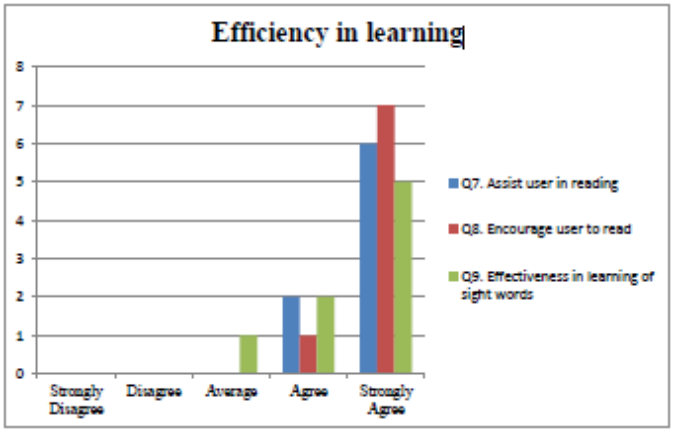

Figure 6. Mr Read Efficiency in learning

In Figure 6, the evaluation is to measure the effectiveness in learning of sight words. It showed 6 of the respondents strongly agreed that Mr Read learning approach is effective. In addition, two respondents have recommended providing the ability for user to sound out the sight words. This can be done by adding new feature, which is, to enable user to record and listen back their voice. This can motivate users to practice more on the spelling and pronunciation of the sight words. This feature is included in future works.

5.4.4 User satisfaction:

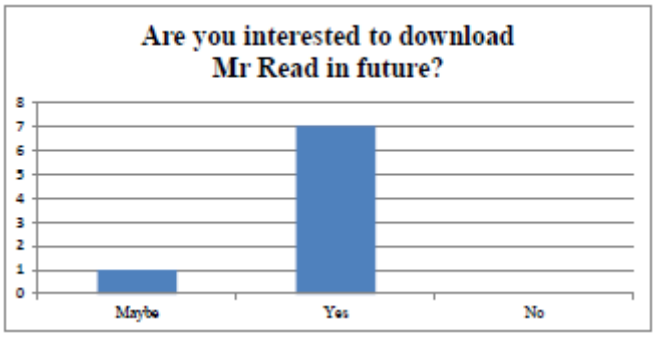

Figure 7. User interest to download Mr Read in future

During conducting the testing, students who testing this application keep playing the game and sing along the song. This shows that the application is able to gain the student's interest. This is because of the use of familiar songs and word game that offers encouraging feedbacks make the student to feel motivated to keep playing and learn at the same time. Based on the Figure 7, it shows 7 out of 8 respondents are interested to download this application in the future. The high number of respondents who are interested to download Mr Read in future proves that Mr Read has the potential to be improved and commercialized. Furthermore, 6 of the 8 respondents, who are teachers, stated that the overall concept of this application is unique since they are usually use flash cards to teach sight words. They also would look forward to the improvement of this application. Thus, the application of sight words in different type of reading platform has brought them to a new experience in teaching and learning sight words.

Overall, a high number of respondents gave positive feedbacks prove that the application is effective in developing reading and spelling among dyslexic children. The use of sight words in different reading platforms can improve the children's reading development. The ease of use and attractive user interface of the Mr Read application in terms of layout, choice of colors, sounds and images makes user, specifically dyslexic children and teachers to navigate the application easily.

6. Summary

6.1 Limitations

Even though the prototype was fully developed according to the specification and objectives, it is found out that there are still limitations that need to be fixed in terms of usability function and performance. Most the limitations exist are due to the lack of project development time. The followings are limitations identified during developing this project:

i. Currently, this application only supports Android 4.2.2 version (Jelly Bean) and runs in tablet device.
ii. The orientation of the application is set in landscape mode.
iii. Noticeable lag in the prototype when transitioning from one screen to another especially in Game module.
iv. The prototype audio will overlapped when the user tap on more than one button.
v. As proposed, the applications features are consist of one short story, a rhyme, a song and a game. However, based on the comments and recommendations from the testing, majority of respondents demands more stories, rhymes, songs and games.
vi. There is no database in the development of this application as it is only focused on teaching the first 20 sight words that are applied in four different reading platforms.

7. Conclusion and Future Works

The application has achieved all the objectives and specification that was specified earlier. Based on the result from the testing conducted earlier, the "Mr Read" application helps dyslexic children to improve reading skills and familiarize the words that often used in daily activities through the use of sight words. Most of the features and functionalities implemented earlier are functioning as expected based on the functionality testing result. However, the success of this project is yet to be determined due to its limitations that have been identified. This application has its own flaws as it is still a prototype with user interface and functionality issues. Thus, it is crucial to solve the issue raised with reference to the future works stated previously. In conclusion, the "Mr Read" application still has the room for improvement to ensure the needs of dyslexic children are met and hoped that they will gain something beneficial from this project.

7.1 Future Works

The following list all of the future works which intends to enhance the application performance.

i. To add support for different Android versions and mobile environment.
ii. To implement automated highlighting for each word that is sounded out one by one.
iii. To add more interesting stories, rhymes, songs and fun games.
iv. To enable user to record their own voice when reading or singing throughout the four modules.
v. To enhance game mechanics, such as add timer for each question in the Game module to give more challenges to the user

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Support, Identity and Ethical Development

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Helen Marie Harmon M.A.L.S.

Abstract

This paper examines the relationship of social support and related concepts, student development, and ethical development. Ethical development has typically been examined in terms of the influence of institution type, size, college major, religious orientation, experiential learning, demographics, and life experiences. Research has produced inconsistent results based on these factors. This paper examines the role of support in promoting student development and subsequently promoting student ethical judgment as a path for a distinct student population. Social support is examined along with social capital, mattering, and marginality. Ethical development is examined through Checkering's identity development theory. The paper highlights one path to increasing student ethical development, by using support to promote student development.

Introduction

This paper examines the relationship of social support and related concepts, student development, and ethical development. Ethical development has typically been examined in terms of the influence of institution type, size, college major, religious orientation, experiential learning, demographics, and life experiences. Research has produced inconsistent results based on these factors. This paper examines the role of support in promoting student development and subsequently promoting student ethical judgment as a path for a distinct student population. Social support is examined along with social capital, mattering, and marginality. Ethical development is examined through Checkering's identity development theory.

The goal of developing highly ethical students has been a common concern for the educational community. However, studies have produced inconsistent results when analyzing various influences. This paper looks at the concept of support and related concepts. It also reviews the influence of support in recent study that examines the influence of social support on a particular group of participants. This paper examines why student development theory can help us appreciate why support can influence certain populations.

Another concern details what educational professionals can do to foster development in students. In the university, we have many resources and assets to use to help students. However, there may be no average student. Student populations differ from one another. Strategies that work on one group may not be influential with other groups. Many paths to development may exist.

Ethical development is an important outcome of a college education. "American postsecondary education has a role in the development of citizens who both think and act morally" (Pascarella & Terenzini, 2005, p. 345). In reviewing research of the last thirty years, these scholars concluded that the college years represent a broad time of student change. Documented changes include statistically significant gains in factual knowledge, cognitive, and intellectual skills, values, attitudes, psychosocial skills, and moral dimensions (Pascarella & Terenzini, 2005). They concluded that a major change in student moral development occurs in college. Recently it has become clear that moral issues are integrated into the context of various disciplines and a renewed emphasis on moral development is needed (McNeel, 1994a).

Currently, there is a broad public and institutional understanding of the need to encourage moral development in college. The National Association of State Universities and Land Grant Colleges (2006) reviewed the National Center for Public Policy and Higher Education poll which indicates that the public expects graduates to have a sense of maturity, the ability to self-manage, the ability to get along with people,

problem solving and thinking abilities, technology skills, career expertise, writing and speaking abilities, and good citizenship practices.

Rest and Narvaez (1991) remind us that there are tens of thousands of ethical interventions annually reported in higher education. Kohlberg (1973) and Rest (1986) have reviewed over 150,000 student responses to interviews and questionnaires. Although we pay a lot of attention to helping students to develop morally, we are not sure how to accomplish this goal. We know that some things work, but we are unsure why they work. Not everyone is affected by certain experiences. There is little agreement by colleges and universities on what programs are the most beneficial. And, even if students show growth in moral development, there is no guarantee that they will act ethically. Derryberry and Thoma (2000) remind us that we have no specific advice from the literature on designing programs to foster moral development. Rest (1986) declares that although a number of factors are known to influence moral development, we are unable to determine why.

Literature Review

Student Ethical Development is the Goal

Moral reasoning is a process where a person arrives at a judgment of what is the moral thing to do in a dilemma (Boss, 1994). Moral reasoning studies are abundant in scholastic literature. The two most recent prolific scholars regarding moral reasoning are Lawrence Kohlberg and James Rest. They produced the most accepted theories of moral reasoning in higher education (Pascarella & Terenzini, 1991).

James Rest (1979, 1986, 1994) furthered the work of Kohlberg in moral development. He advanced Kohlberg's theory by advocating that individuals operate in more than one stage at a time. He found correlations between moral judgment and those who love to learn, seek new challenges, take risks, take responsibility for themselves and their environments, and operate in social milieus that support them. Much of moral development occurs as people develop socially (Rest, 1986). Rest developed the Four Component Model to explain moral behavior. He recognized that judgment is just a part of moral action. The model explains the psychological processes needed to perform morally in a dilemma. It includes moral sensitivity or the ability to identify a moral issue in a dilemma, the use of a moral judgment framework, the moral motivation to put moral values ahead of other values, and the moral character to take the morally correct action (Rest, 1986).

Rest developed an objective systematic test called the Defining Issues Test based on the scenarios of Kohlberg's Moral Judgment Interview. This test measures one's preference for more complex differentiating and discriminating moral considerations. Respondents encounter moral dilemmas and choose alternative courses of action, noting reasons behind their choices. This test calls on respondents to reflect their current moral judgment framework. The test measures the percentage of post conventional moral reasoning (thinking like a philosophy major) used in responding (the *p*-score). This *p*-score reflects the percentage of reasons that respondents tell us refer to rights, values, and universal principles. Over 58,000 DIT tests have produced consistent results (Rest, 1986, 1993). There are limitations to the DIT, see Thomas and Dunphy (2014) for a discussion.

Student Development Theory

College provides a vast opportunity for student growth in a number of dimensions including ethical development. Documented changes include statistically significant gains in factual knowledge, cognitive, and intellectual skills, values, attitudes, psychosocial skills, and moral dimensions (Pascarella & Terenzini, 2005).

Catalysts may cause a particular student to be more receptive to growth. Kohlberg believed that development is the transfer of reasoning to more complex cognitive structures that result from interaction with one's environment (Kohlberg, 1981). Rest (1086) believed moral development occurs as people develop

socially. Erikson (1959) suggests that anything that grows has a plan to grow. Growth occurs when a crisis creates a need for a decision based on psychological changes interacting with cultural demands. This results in progression, regression or stasis.

On such theory of student development was defined by Chickering (1966). Chickering (1966) states that development occurs through of differentiation of culture and experience and integration. He argued that the impact of experiences depend on the characteristics of the people who encounter them. This implies that that there are many paths to development. Certain paths may be more influential to certain students.

Phycologists view student development as a series of developmental tasks, including qualifications in thinking, feeling, valuing behavior and relating to others (Chickering and Reisser, 1993). They suggest that personal development is the primary impetus to develop moral reasoning. Relationships with other persons exert the most powerful influences on individual development (Chickering, 1974). Individuals may develop personally along the lines of Chickering's theory. Students may advance along the certain vectors of personal development at different rates. Advances in some vectors would affect advances in others. As people develop, their social skills would improve, enabling them to enjoy more meaningful friendships and record greater social support. As their development progresses and their social support increases, they develop the confidence to enhance their ethical judgment. For example, Chickering included vectors in managing emotions, moving toward interdependence, and developing mature interpersonal relationships. It appears that these vectors may be associated with social support and the confidence it brings to individuals. .

Chickering and Reisser (1993) state that identity development involves students becoming aware of who they are, developing a comfort with themselves, and not requiring them to rely on others for their own satisfaction. Support may be a path for students to develop identity. Getting to their identity may require the support of others for certain populations.

Chickering's Vectors

Chickering and Reisser's (1993) vectors provide a good guideline for student development. Many of their vectors reference support from others. They highlight differentiation and integration. Learning and development occurs as students encounter new conditions and experiences that are important to them and for which they must develop new competencies or attitudes. Students move through autonomy to interdependence. Development depends on feedback from others (Chickering, & Reisser, 1993).

Achieving competence is their first vector. This includes competence intellectual areas, physical skills and interpersonal skills. Chickering's competence vector includes interpersonal relationships. Competence involves sensitivity to others. It involves a sense of one's worthiness. Interpersonal competence includes not the skills of listening, cooperating, and communicating effectively, but also the more complex abilities to tune in to another person and respond appropriately. It also includes aligning personal agendas with the goals of a group and to choose from a variety of strategies to help a relationship grow or group to function. Students rely on others for support and to affirm their behavior. Chickering's interdependence vector includes student growth by arriving at a point where they no longer need constant support, affirmation, and approval (Chickering, & Reisser, 1993).

The second vector is managing emotions. Students arrive at college with a variety of emotions. Students learn to manage these emotions by learning appropriate channels for releasing irritations, dealing with fears, and healing emotional wounds. Students learn to balance self-assertiveness with participation. They need to rein in open emotional expression or find their own expression. They need to go beyond the boundaries of self and identify with others and become a part of a larger whole (Chickering, & Reisser, 1993).

The third vector is moving through autonomy to interdependence. These relationships result in a new openness to differences in ideas, people, backgrounds and values. While this vector involves a lessening need

for outside support, it acknowledges a broadening of the interdependence with greater communities and societies (Chickering, & Reisser, 1993).

The fourth vector includes developing mature interpersonal relationships. Student interactions with peers provide powerful learning experiences. Relationships reflect an increase in intimacy and commitment toward a mutual interdependence. Friends provide support and feedback. This includes a complex combination of autonomy, interdependence and intimacy (Chickering, & Reisser, 1993).

Chickering lists an identity vector where students learn to be comfortable with who they are. Identity involves comfort with body and appearance, comfort with gender and sexual orientation, sense of self in a social, historical and cultural context, clarification of self through roles and life-style, sense of self in response to feedback from valued others, self-acceptance and self-esteem, and personal stability and integration. It involves gaining a sense of how one is seen and evaluated by others. It involves an assurance of recognition from people who count. It involves those we respect and their feelings toward us. It welcomes warm support from others. It welcome feeling usefull to others. Support is important. Identity is a result of the support of others (Chickering, & Reisser, 1993).

Purpose is the sixth vector. This involves expanding competencies, developing interpersonal relationships, and clarifying identity. This means students need to know who they are and who they are going to be. Students value external validation. People develop plans for action and priorities that integrate vocational aspirations, personal interests, and interpersonal commitments (Chickering, & Reisser, 1993).

Developing integrity is the final vector. Rules are evaluated based on the purposes they are intended to serve. We need the acceptance of people significant to us. We look for the approval of our social group. We need the support of our close friends. This involves humanizing values away from uncompromised beliefs while balancing our own and others interests, personalizing values while respecting other's points of view, and matching personal values with socially responsible behavior (Chickering, & Reisser, 1993).

Most of these vectors mention or rely on the concept of support or relationships to achieve progression in the various vectors. Chickering highlights support often.

Social Capital

Support is a component of what Social Psychologists call Social Capital. The core idea is that people are social animals and their social networks have value. Just as a screwdriver or a college education can increase productivity, so do social contacts affect the productivity of individuals and groups (Brooks, 2011). Social psychologists believe that behavior results from the interplay between the unconscious and conscious minds. Most behavioral modification programs and interventions focus on our will power and our conscious minds. These programs tend to fail. Programs that strengthen our perception of situations with our subconscious mind promise greater success (Brooks, 2011).

Social capital refers to connections within and between social groups (Portes, 1998). Social capital is a concept formed centuries ago in response to the industrial revolution and the age of rationalism. The concept of people working together to support each other is reported in the writings of Aristotle, Thomas Aquinas, and Edmund Burke (Bowles & Gintis, 2002). The French sociologist Bourdieu (1986) mentioned social capital as one of the four forms of capital that formed a structure of society and explained its actions. He felt that social capital referred to the social connections people create in developing usable social networks. Capital also referred to the resources linked to those networks. As a follower of Marx, he felt that social capital could be used to better societies. His work explains how social classes preserve their social privilege over generations. He explains how people are guided by their predispositions and fundamental unconscious beliefs in their decisions.

Social Support

Social support enhances social development, personal development, and is one aspect of interpersonal relationships. Social support in psychology consists of two separate elements, the perception that the student can turn to a sufficient number of available people in times of need and the degree of satisfaction the student finds with the available support. Although research on social support centered on medical and stress issues, social support has since been related to social development, personal development, and ethical development. Acceptance, affection, and affirmation are important in social support. Individual psychological makeup may determine the number of supporters an individual feels are necessary. People high in social support report more positive events in their lives and these events exert a greater influence on their lives. In addition, these people believe they have more control over life events. People high in support believe they have more rewarding personal relationships. People high in social support seem to experience more positive events, have higher self-esteem, and have a more optimistic view. Social support contributes to positive adjustment and personal development (Sarason et al, (1987).

Cobb (1976) defined social support as the individual belief that one is cared for, loved, esteemed, valued, and belongs to a network of communication and mutual obligations. Perceived support is just as important as actual support. Social support is often attributed to positive adjustment and personal development. There is an assumption of belonging to a support network (Larose et al, 1999). Some believe that developing support is a cognitive function built with personal constructs from positive early relationships with caregivers. How people process the support available to them is an important cognitive factor (Sarason et al., 1985).

Mattering and Marginality

Schlossberg (1989) developed a related concept called Marginality and Mattering which ties into her transition theory. She states that when people take on new roles, especially when they are uncertain of what it includes, a sense of not fitting in can cause self-consciousness, irritability, and depression. They feel marginalized. On the other hand, if they feel they matter, they are more likely to grow into the new role. Mattering has five aspects. People matter if they feel they are object of another's attention because they are being noticed. They feel important if they believe they are cared about. When someone is proud of them they get an ego boost. If they are needed they feel depended upon. They feel appreciated when someone cares about their efforts. Mattering helps people grow (Schlossberg, 1989). Chickering (1989) also addressed Mattering. He stated that if students believed they mattered to someone else, that they were the object of someone else's attentions, and that others cared about them and appreciates them, they are far more likely to persist and succeed. If they do not feel anyone cares about them or their success, if they feel ignored and not accepted; they will feel marginal and are much less likely to succeed.

Schossberg (1981) developed her transition theory for analyzing personal growth. Transitions are any event or nonevent that results in changed relationships, routines, assumptions, and roles. She believes that change is affected by three sets of variables: the individual's perception of transition, characteristics of the pre change and post change environments, and the individual's characteristics. Those characteristics include the individual's strengths and weaknesses based on their experiences. They include the actual or perceived support. And, they include the individual's strategy for coping.

Recent Study

A recent regression study took place at a regional, public university (Thomas & Dunphy, 2014). It is a commuter campus with older students that currently enrolls approximately 5,500 students. The student body comes from 29 different cities, a variety of different social classes, and rural and urban areas. Freshmen typically

score in the bottom third of the country in SAT scores. Incoming freshmen average in the low 900's on the SAT. There is substantial variation in the quality of students' high school preparation. The range of passing scores on the ISTEP was from 30% to 70%. There is a high proportion of first generation college students, nontraditional students, part-time students, and students who are the primary supporter of their families. The student body is two-thirds female; two-thirds work an average of 28 hours a week, and over a third are minority. The area traditionally has a manufacturing base with jobs available in the steel mills and other factories located nearby. The average student age was 26. School enrollment varies inversely with the local economy (Thomas & Dunphy, 2014).

In this study, significant variable included satisfaction with social support, college major and lower religious orthodoxy scores. Satisfaction with social support accounted for significant variances in student moral development. It was the most significant factor to influence ethical development in this regression study for this particular population (Thomas & Dunphy, 2014).

Discussion

The research review suggests that support may in fact be a possible significant influence in student development and therefor ethical development for a particular student population. A number of other studies have suggested that social support was a critical issue in student development. And, student development was critical in moral development. Pascarella and Terenzini (1991) summarized the research by saying that students who were more engaged socially, politically, academically, and culturally reported greater increases in moral development. Students need to be accepted and valued by important others. Student contact plays a critical role in identity development. McNeel (1994b) suggested that there was a relationship between moral judgment and whole person development. Students who advanced in ego and identity status showed growth in principled reasoning. Spickelmier (1983) suggested that there was a relationship between moral judgment and whole person development. Students who advanced in ego and identity status showed growth in principled reasoning. Burwell, Butman, and VanWicklin (1992) found that growth in principled reasoning was correlated with developing one's own sense of identity. Rest (1986) determined that much of moral development occurs as people developed socially. Erickson (1968) says that in order to find our own identity, we need to have an inner assuredness of anticipated recognition by those who count.

These studies have confirmed a relationship between social development, student development and moral judgment development. Pascarella and Terenzini (1991) summarized current research by saying that students who were more engaged socially, politically, academically, and culturally reported greater increases in moral development. These studies also support the unfluence of social support in ethical development. Haan (1985) and Walker (1996) believed that it is not cognitive dissonance but social dissonance that increased moral development. Josselson (1987) discussed the influence of anchoring or how students relied on family husbands, career and friends. These studies agree that social growth is important to moral development. Kuh (1981) states that peer support and support networks positively affect students. Chickering (1993) believes that students need to have others affirm the validity of their feelings to form identity. Students disengage emotionally from their parents and find reliance on peers and role models. Friendships provide invaluable support and comfort with positive feedback. Gilligan (1982) believed female students defined themselves in terms of their relationships with others.

One path to developing ethical judgment may include social support to encourage student development which in turn encourages ethical judgment development. A significant number of studies found that support is important at least for certain individuals. Social support may be the catalyst that enables certain students to benefit from the informal curriculum and advance in moral development. In the regression study, those students who believed that they had a greater number of supporters and that they received a greater amount of satisfaction from their support evidenced higher levels of moral judgment. While regression and correlation cannot indicate

causation, the findings do suggest a strong relationship between these variables. There appears to be a connection between social support, social development, student development and moral development at least for those students in the study (Thomas & Dunphy, 2014).

Recommendations

What can we do?

There are a number of strategies that colleges can undertake to influence student development and hopefully ethical development. These strategies involve the faculty, other students, student affairs and the administration.

The faculty can influence student development and provide support. Faculty can provide opportunities for interaction with students. This interaction can increase students' interpersonal skills. Faculty can listen to students and respond to their problems. Faculty can provide accessibility through office hours and other interactions. Faculty can provide cooperation, opportunities for active learning and community engagement, and feedback while holding high expectations and providing support. Faculty encourage contact with authority, paths toward knowledge, communication, using the formal curriculum, covert or implied tactics, mastering news, and learning professional assumptions, values and expectations. Faculty are role models. Faculty can relate curriculum to student experiences. They can recognize individual differences. They can create encounters with diverse perspectives that challenge assumptions. They can provide activities that challenge assumptions (Schollberg, Lynch, Chickering, 1989).

Besides faculty, another major impact of college comes from peers. Other students' influences include learning communities where students can explore separate learning and connected learning. Students can experience identity of cohesive purpose. Students can provide support through service clusters and support groups. Students need opportunities to share stories with supportive groups. Students can affirm the validity of feelings and help form identity. Mentors help students manage emotions. Students looks for role models in other students. Student groups help students to achieve goals. The impact of a college education is dependent on the students present (Chickering, 1993).

Student affairs are in a unique position to provide support and influence outcomes. They are in a unique position to create and maintain a powerful environment. They are in a position to provide an environment conducive to student development through sponsored activities and support services. Schlossberg, Lynch, Chickering (1989) recommend designing programs for entry services, support services, and culminating services. Their support services include academic support, personal counseling, department programs, recreation, athletics, cultural activities, health programs, support groups and mentoring. Chickering (1966) suggests selecting significant dimensions of students' diversity, select indexes, establish criteria, measure development measures, create programs to enhance results and communicate those programs to everyone.

The final partner in student support comes from the college administration. Commuters are less likely to promote attitudes and values to lever self-awareness and hasten development (Pascarella & Terenzini, 2005). So administrative strategies need to compensate. Chickering (1993) recommends that institutions agree on clear and consistent institutional objectives that are well publicized. Colleges need powerful curriculum, active learning strategies, and opportunities to promote friendships and communities, strong student development programs, and a powerful educational environment. Colleges should be aware that size impacts students. Institutions support reliable resources and a student centered environment. They can find ways to encourage expressions, sharing feelings, and collaborative behaviors. Administrators can act as co-learners. Colleges can design curriculum to make the content relevant to student experience. They can work to reconcile individual differences. They can create encounters with diverse perspectives that challenge assumptions and provide activities that integrate diverse perspectives.

This study has examined the results of a recent regression study and the literature surrounding the concept of social support in terms of student development. It seems consistent that for certain populations support can influence student development and possibly social development. Further research is needed to investigate the importance of support for other populations.

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The importance of Paulo Freire ideas for health education in Brazil

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Abstract

The theoretical production of Paulo Freire value the popular knowledge and the exchange of knowledge in establishing a relationship of trust between health professionals, patients generally to pregnant / lactating women and family for the actions of health promotion. We can observe the presence of Freire's ideas, most important popular educator from Brazil, fairly present in health education, specifically in humanized care, which is extremely important for the activity of nurses and educators.
While nurses / educators, we must think about the social context in which the patient lives, their limitations, their abilities, difficulties and facilities. It is very important know the reality of patients and family so we can provide nursing care and health education properly, thus establishing effective education conducts both in their treatment in health facilities as the continuity of their treatment at home .

Introduction:

Paulo Reglus Neves Freire, born on September 19, 1921 in Recife, Pernambuco, was an educator who has developed an innovative method of adult literacy in the area of popular education. It is considered one of the greatest thinkers in the history of world pedagogy. It became an inspiration to generations of teachers, especially in Latin America and Africa. Your thoughts outlined a Pedagogy of Liberation, related to the Marxist view of the third world and in the mobilization of the oppressed classes in the sense of the exercise of education as a right of citizenship, and be political and social in building his life story. [1]
Freire sees education as a dialogical relationship between student and educator, where freedom is a fundamental assumption, since it allows the subject to a discussion of its problems and its insertion in the world. So he speaks not only of a word reading, but a reading of the world, for that education assumes that no one educates anyone and that everyone learns in communion, from the world's collective reading. In this way, the author proposes and supports an education from the subject's reality, namely, a critical-dialogical education where the teacher facilitates the construction of questions and no answers ready and finished. That is, the articulation of knowledge critical to the popular, mediated by the experience of the world [2].
Nursing in its growth as a profession, has assumed various roles and positions, and its subject matter the care / caring. Faced with the practical matter of subjectivity experienced by nursing professionals, which sometimes is ahead of many routine activities can be seen in front of a puzzle, having difficulty understanding the multiple facets of this concept. According to this thinking, on the recognition of objectivity / subjectivity of the ways of caring in nursing, there was a study that resulted in 46 forms of care, from admission to discharge / death, showing that the diversity of interactions the individual with the professional, various objective forms can be identified [3].

Objective:

This study aimed to:

- To search the literature how important is the educator Paulo Freire for health education in Brazil.

Methodology

Type of study

This study it is an integrative literature review (IR) research, based on Cooper (1982), defined as a method that brings together the results of research on the same subject, in order to synthesize and analyze this data to develop a more comprehensive explanation of a particular phenomenon.
The integrative review is developed from five stages: problem formulation , data collection , data evaluation , analysis and interpretation of data and presentation of results (Cooper , 1982).

Problem formulation

The formulation of the present study problem was through the guiding question “What is the importance of the educator Paulo Freire ideas for health education in Brazil?“.

Data collection

The search for articles was held at Latino database Literature - American and Caribbean Health Sciences (LILACS), the database Scientific Electronic Library Online (Scielo) Medline and Bireme, Web of Science and PubMed.
The descriptors used in the search for articles were: EDUCATION, HEALTH, NURSING, Paulo Freire.

Inclusion criteria

Healthcare articles were included, these areas: Nursing, Education and Health containing the theme of health education related to ideas of Paulo Freire, the language Portuguese, English, or Spanish, the last ten years (2004-2014) resulting from qualitative studies, quantitative, available online in full and free.

Exclusion criteria

Not available full articles were excluded, with previous publication the last ten years, no publications available electronically, free access at no cost, as well as theses, dissertations and completing courses jobs.

Data evaluation

This data evaluation stage , it designed a tool to record information (Appendix A) extracted from articles which was completed after reading the articles.
The fields that were understood to Appendix A : article title, author identification , serial, article publishing year objective of the study , the study methodology, results and conclusion.

Analysis and interpretation of results

This step was carried out the synthesis and comparison of data extracted from articles to be registered in a general summary table (Appendix B) , in order to highlight the ideas of each author who answered the guiding question of this study : How important are ideas educator Paulo Freire for health education in Brazil?

Presentation of results

The presentation of the results was made with tables, charts and graphs, with the intention of comparing the ideas of authors who understood the sample of this study on the contributions of Paulo Freire's ideas for health education in Brazil.

Ethical aspects

All the productions used in this work were referenced as the standards of the Brazilian Association of Technical Standards (NBR 6023, 2000). It has respected the authenticity of the authors of the ideas in question constitute the sample of this study.

Results and discussion

At this stage of the study, we characterized the statement of findings of integrative review that data were presented through analysis and discussion of results.

Sample characterization

Initially by crossing the descriptors in health Medicine® (MeSH), it found a total of 176 scientific articles in the databases consulted. After initial selection by the availability of online full-text and year of publication yielded 126 publications. Next, the reading was held the titles and abstracts limiting the sample to 56 publications (10 in MEDLINE, 16 in LILACS and 30 in SciELO). After reading in full of papers, we selected articles 3 (1 in LILACS, MEDLINE and 2 on 2 on Scielo) that formed the database for this job.

Next, the table below presents the list of articles that constituted this study and their respective owners.

Article	Title	author	Year	Objective	Type of study
01	Health education: prospects for a team Health strategy from the perspective of Paulo Freire	Maria Clara Porto Fernandes; Vânia Marli Schubert Backes.	2009	Know their perspectives on health education and problematize them through the dialogical conception of Paulo Freire .	qualitative / bibliografic review
02	Climacteric women : a proposal for clinical nursing care based on freireanas ideas .	Cláudia Rejane Pinheiro Maciel Vidal; Karla Corrêa Lima Miranda; Patrícia Neyva da Costa Pinheiro; Dafne Paiva Rodrigues.	2012	Dialogue between the concepts care and education and propose a strategy of education in health as a possibility for nursing clinical care for women in climaterio based on educational principles of Paulo Freire .	qualitative / bibliografic review

03	Theoretical constructs of Paulo Freire guiding the breastfeeding promotion strategies	Francisca Márcia Pereira Linhares; Cleide Maria Pontes; Mônica Maria Osório.	2014	Reflect on the integration of theoretical constructs of Paulo Freire , dialogue , ethics and questioning in breastfeeding promotion, involving the social network of women.	qualitative / bibliografic review

With regard to the language of the articles in this integrative literature review , the three articles selected for the final study were published in the Portuguese language.

The importance of Paulo Freire for health education

The educator Paulo Freire is of paramount importance to the link between education and health, for today working in multi disciplinary team. Teamwork is essential both for health professionals and to educators. Often health professionals become educators, approaching the sick people and developing educational activities with them, providing a better understanding of health care. Importantly, this closeness does not refer only to patients but also to integrated and organized health care team.

In this work the health and education are closely articulated, they are seen as complementary and essential to the progress of the family health strategy. Health and education can not be separated, go together, are organized as social practices [4].

Health education is highlighted within the functions of the professional members of the family health teams, and it is emphasized even more in the nursing work process. The practice of health education requires the health professional, especially nursing, in proximity to this practice, a critical analysis of their performance as well as a reflection of its role as an educator [5]. The very concept of nursing bases called for the nurse's role as an educator, after all there is no care without educating and vice versa.

On the assumption that education is established as a branch intertwined health becomes the responsibility of health pay attention and practice health education as an educational process of building knowledge health professionals aimed at appropriation on the subject by the general population. It is also the industry practices set that contributes to increasing the autonomy of the people in their care and in the debate with professionals and managers in the industry, to achieve health care according to their needs [6].

Over the years, different paradigms of health education are conditioned by different strategies, many reductionist, which requires questioning and implementation of more integral and participatory actions. From this thought, we seek a possibility of education that addresses the other in its complexity, enabling the patient can also be seen in full. In this scenario, we see the principles of Paulo Freire as a framework for guiding this development, for it shows a dialogue-based, supportive education, without arrogance, combining scientific knowledge with popular knowledge, translating his method in a collective work [7].

The development of educational activities grounded in a theoretical framework can guide the inclusion strategies to promote breastfeeding, based on critical reflection of liberating educational practice, centered on knowing dialogical, questioning and being ethical in the context of the reality of all the actors involved the patient and their complexities.

The theoretical constructs of Paulo Freire value the popular knowledge and the exchange of knowledge in establishing a relationship of trust between health professionals, patients in its many complexities, pregnant / lactating women and family for the actions of promotion of breastfeeding [8].

Final considerations:

This article aimed to address the importance of the educator Paulo Freire for the exercise of health education in Brazil. Their practices were extremely important in the past and has remained in this. Today we work with the idea of liberating education in health, autonomous and popular. Thus, know and recognize the work of this important intellectual gives us the necessary support to develop humanized care, as recommended by the agencies that administer health in Brazil.

Health professionals began to take ownership of educational tasks, whether in the hospital, are in other areas of health. There is no health without education, and there is no education without health. Paulo Freire brought us the idea of the pedagogy of autonomy as a practice in which we approach the subject and develop with him a freedom to teach and to learn, where we hear your opinion, where we educate and are educated, where we discussed concepts of health and education, about the society we live in and its complexities, where we hear the difficulties of patients on adherence to their treatment.

It is essential appropriating the reality of each patient, knowing your social life context so we can apply this form of education, where we teach and learn, where it is vital to teamwork and learning literature search, with professionals and also with patients. Only through education we acquired freedom, only through it guarantee an adequate patient care, only through education can provide patients the necessary learning about how to deal with his illness / treatment.

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Discussing the Construction of Gratefulness Education in Modern Times

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Abstract

Gratefulness is Chinese traditional virtue, which gives Chinese the power to go upper ,encourages Chinese to understand others, having a important meaning to cultivate personal character, perfect the life meaning. In addition to this, it is necessary to build the harmonious camp and society. However, at present as a necessary part of the students' education in university, it is also weak. There is no delay to strengthen the gratefulness education. This dissertation aims at probing into the reasons of loss of gratitude feeling, thereafter puts forward the countermeasures for this issue.

Key words: gratefulness education, harmonious campus, Modern Times

Introduction

In Chinese traditional morality, drips of beneficent water must be repaid with overflowing fountains of gratitude, this is the demand put to the beneficiary. The well-known saying" who grass-inch heart, reported in the apartments, "Expressed the grace of the children for the mother of endless feelings. To "balance the book" when they get favors, is the communication style in social activities. Gratitude, the traditional Chinese virtues, is the sign of noble souls, we should constantly develop and inheritance. The lacking belief of university students and the society environment account for the phenomenon. However, with the development of economy and society, the gratitude deficiency in undergraduates is becoming increasingly serious. The lack of thanksgiving among the contemporary college students has occurred from time to time with various reasons, sounding alarm to college Thanksgiving education. In views of harmonious society, the construction of harmonious university pays more attention to personality, harmony, sustentation and multiplicity.

1. The implication of gratefulness in China

Thanksgiving is a traditional virtue of the Chinese nation, to build a socialist harmonious society needs. The gratefulness, to an extent, means being grateful to people who has helped you in trouble. In other words, it also is full of thanks. The gratitude consciousness, as Chinese traditional virtue, has lasted thousands of centuries, which is embodied deeply in Confucianism. The idea of gratefulness and harmony is a rich philosophical concept in classic Buddhism and Confucianism, whose culture is concerned with self- cultivation and shaping of an ideal personality. However, in Chinese traditional culture, the dominant idea—Confucianism—always plays emphasis on "loyalty" and "filial piety", arguing the power which belongs to lords, officials, and parents. Filial piety is the historical and realistic basis of traditional Chinese autocratic culture, with filial piety as the prerequisite of loyalty, and loyalty as the extension of filial piety. if Chinese culture aims at cultivating healthy individuals, it must reconstruct the concepts of loyalty and filial piety that suit human nature. To a great extent, loyalty and filial piety are the earliest gratefulness in China.

2. The lack of gratefulness

At present, most of modern college students come from the “only child family”. On the one hand, protected by their grandfather, grandmother, and parents, and treated well, maybe in their opinion, it is responsible for their parents to take care of them, supply the best things in the world to them. Parents spare no efforts to service their children without any rewards; On the other hand, in parents’ opinion, it is the first duty for their children to study well. So most of the children are only to learn and less time to learn other things, especially Chinese traditional morality. For example, “Don’t do unto others what you don't want others to do unto you” is an important principle in traditional Chinese ethics.

2.1 The lack of gratefulness in Chinese family

Four of the traditional Chinese values, are most prized: loyalty, filial piety, chastity, and righteousness. Containing abundant and abstruse moral philosophy, mercy, justice and courtesy, the Analects are the core of social morality, based on the professional morality and piety family virtue. Well-known to us, loyalty and filial piety are the most important human virtues in Chinese traditional culture. However, in China there is only a child in the family; the parents try their best to take care of them with heart and soul. It is easy to get the bad habit of being self-willed, selfish, overbearing, and lazy and so on. Some children over-spoiled undoubtedly receive a poor education. Among the potential problems, those children face the absence of any sort of family grateful education, degraded school records and other psychological problems. Family education is an important factor that has a great influence on the growth of children. The deficiency of family education will lead to an irreparable influence on the children. In short, we should pay more attention to family education.

2.2 The lack of gratefulness in colleges and universities

In addition, the lack of family education, students in colleges and universities are lack of gratefulness, too. Most children, being lack of gratefulness, are cold-hearted, selfish, and ungrateful, which make them lonely and unsuitable to the society in colleges and universities even after graduation, with indifferent relatives and relationships. One of the reasons which brought in the result is the lack of the family education of gratefulness. The relationship between teachers and students is also indifferent; what’s more, these students have light responsibility for society. Main reasons for these problems are the absence of family education, social changes and the world's multi-cultural influences, besides foreign bad ideas of the erosion. In addition, the lack of family education, Students own lack of motivation and interest in, such as the strict requirements of the gratefulness and emotional impact on students.

Therefore, we should change our mind，renewing the educational ideas, to strengthen the links between the school and family, to change the situation of lack of family education. Grateful education is the important and essential foundation stone of colleges' moral education. However, at present, in colleges and universities, some students have a weak sense of thanksgiving; they don’t know how to respect the teachers and other students, or how to get along well with the classmates. As for Thanksgiving actions missing, the reason is mainly due to some faults of family education and school education. In the modern times, some of the students only know how to play, enjoy life, seeking colorful life, famous products, who seldom read books and do those things they should do, ignoring their parents’ hard work. They have little gratefulness for their parents’ giving and other people’s help. However, those unhealthy phenomenons, not for a certain reason, but for some other reasons, four of the most reasons are: family education, school education, neighborhood education and society education.

3. The necessities of strengthening the gratefulness education in colleges and universities

At the present time, some college students have a weak sense of thanksgiving, lack of thanksgiving actions. The mainly reason is due to some faults of family education, school education and society education. Now, our society is looking after a harmonious one. Only when we realize the importance of gratefulness each other can we be devoted to building a harmonious society.

3.1 Gratefulness is the necessity of the college students' own development

In our life, learning to be grateful is necessary for the college students, helping the students to be suitable to the society, and making themselves a better life. This paper aims at probing into the reasons of loss of gratitude feeling, and then puts forward the countermeasures for this issue. But the moral character of children should be taught in the morality of family, school and society and form stage by stage below moral edification. Therefore, education, with the momentous task, has not only the responsibility to develop the moral character of the individual, but in virtue of that, to work towards the perfecting of the human race. In modern China， the moral education, while absorbing the traditional ethical culture, has to face up with "filial piety", which is the original and chief concept and virtue of Confucianism culture. Absorbed in the various things in their life, the teenagers in the vulnerable position are easily to have various unhealthy mentality and temper, which urges them to lose their gratitude consciousness. A tiny gratefulness can give us a lasting positive mood, which requires our consciousness and gratefulness. Then with a heart of gratefulness, everything turns out to be gorgeous. As we all know, in interpersonal communication，it is essential for everyone to help and respect each other. If the students have no any sense of gratefulness, they will meet a lot of difficulties of communications in society.

3.2 Gratefulness is the necessity of the harmonious university campus

In the modern times, most of the college students have indifferent relatives and relationships, without close relationships between teachers, parents, friends and so on and still less between the strangers. Those, who are lack of the sense of great thankfulness, don't get well along with the other persons. The form of the gratitude consciousness of the vulnerable group in these teenagers plays an important role in teenagers' healthy development. Thanksgiving awareness among contemporary college students, ungrateful occurred from time to time, in order to change this situation the need to strengthen education students Thanksgiving. The colleges and universities, whose construction of harmonious campus is an important part to build up a harmonious society, also an important condition for students' healthy growth. What's more, in the process of building a harmonious campus, students are the main universities, the backbone of the harmonious campus. The construction of harmonious campus and harmonious society is inter-connected, interacting and inter-prompting. Strengthening the gratefulness education of university students is the important content of constructing the harmonious university campus, with deadly practical and significant for promoting harmonious campus construction. Whereas, the harmonious campus is favorable for the healthy and harmonious development of university students. As a part of moral education in college, thanksgiving moral education is a difficult and urgent task today. Administering University by law is a necessary demand of constructing a harmonious university campus. And the gratefulness is important for constructing a harmonious campus. Building a harmonious campus is part of building a socialist harmonious society.

3.3 Gratefulness is the necessity of the harmonious society

Training the colleges in gratefulness, promoting emotional competence and broadening pro-social models

can prompt them moral education, engaged in pro-social behaviors. Building a socialist harmonious society needs to carry forward grateful Spirits, which helps to further enhance campus harmony of a socialist university.

The construction of the harmonious society includes the following aspects: the harmony between persons and nature; the harmony between persons and persons; the harmony between persons and society, and so on. They are inter-connected, interacting and inter-prompting.

4. To build the harmonious college campus

Thanksgiving education is an activity for the awakening of the thanksgiving consciousness. The construction of a harmonious campus should aim at the all-round development of college students and intensify the education of the students concern for life.

Firstly, honesty construction is a key standard of a high-quality for college students. Secondly, the healthy personality is connected with the construction of harmonious campus. Known as the core of the university, healthy personality plays an invaluable role in the process of building a harmonious campus. To develop their responsibility for the family, school and society, making great efforts to build up accurate indebted consciousness among students, activating their sensibility and developing practice on indebted action.

Obviously, this development has many objective and subjective conditions. In order to rebuild the students' thanksgiving consciousness, we should go on the construction of the idea, target, content, system and so on. Specially, it is necessary to establish morals duty mechanism, compensate morals reproduction cost, create social security system and reinforce feel grateful education.

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Relationship between Teachers' Attitudes about Principals' Communicational Jobs toward School Size, Level of Teachers' Education, Workload and Gender

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Abstract

The aim of this research is to examine teachers' attitudes about principals' communicational job. Secondary aim is to examine whether number of shifts, number of students, teachers' level of education and teachers daily and weekly workload predict teachers attitudes about principals' communicational jobs principals perform. Sample consists of school teachers (N=80) that covered ISCED 1, 2 and 3, educational level from the Republic of Croatia. Sample is intentional and occasional, and present experienced teachers suitable for this type of research. The scale constructed for this research has been extracted from the scale for principals' role estimation constructed by Burcar (2010). Findings show existence of principals' communicational jobs in the schools as informing, reporting and verbal communication. Gender differences in the scale exist and in the subscale for verbal communication as well. In the prognosis toward principals' communicational jobs the level of teachers' education has statistically significant but negative predictive value.

1. Introduction

1.1. Management, leadership, principal, job, role

Many different articles pointed that management and leadership exist in profit and nonprofit sector and accordingly in educational institutions as well. During last fifteen years, there are plenty of researches and articles in both, profit and nonprofit sector dealing with the managers and leaders roles, jobs and tasks they perform. In this research, we examined the principals' communicational jobs, which is a basic pillar for principals' communicational role performance. Much more precisely, we examined principals' communicational jobs from the teachers' angle.

There are plenty of researches dealing with managers and leaders' communicational role and all of them mostly guide us to conclusion that communicational role is one of the most important role that managers and leaders perform. Principals' roles in educational system has been seen as and through mangers and leaders roles as well. In the background of the role, acting could be seen, what is explained by Burcar (2013), "Through acting, tasks were realized. By realizing tasks, goals were achieved. Achieving goals guide to the role accomplishment."
Principals in Croatian school system perform many different jobs: a) collecting and dividing information's, b) communicating with staff, pupils, parents, superior and local community, directly or through technology, c) strategic planning depending on human recourses, teaching and other recourses, and pupils as well, d) managing, administrating and organizing as a chairperson, responsible person, and well skilled person, e) supporting and lecturing (building relations, motivating, educating, and supporting) highly educated staff to produce high level of the pupils output, f) evaluating, which analyze, monitor and evaluate processes and results, g) learning as permanent investing in its own knowledge, skills and behavior, h) binding with community through various protocol activities (Burcar, 2014).

1.2. Communication and school management

In the contemporary educational conceptions education is described as an interpersonal relation or complex process of interactions between educational subjects, for what communication is one of the most important tools. Communication as multidimensional process includes information, confirmation, feed-back and interpretation (Arlesig, 2008). Communication is information transfer under the condition that receiver understands sent information (Weihrich & Koontz, 1998). Burcar (2013, p.187) implies that principals transfer information's through communication, what is one of the crucial pillars of managing and leading. Furthermore, communication in the organization has broader purpose than simple information transferring. Communication is a process for activity coordination, understanding, developing and accepting goals of organization (Heide et al. 2005).

School is an educational institution with its' educational potentials and elements (Vrcelj, 2000). In the school many different processes conduct, not only educational, but also business processes such as planning, organizing, coordinating, evaluating, etc. In the contemporary business environment school has been researched as a working organization and as a system which have incomes, transformational processes and measurable outcomes on the educational market.

Researches about school management whose components are: managing and leading (Staničić, 2006, p.21) shoves the importance of principals' communicational role inside this components. Burcar (2010, p.84) pointed that the role of the principal in the school is orientated toward management and leadership, and to work with and through the teachers for what excellent communication is the basic presumption. It is hard to realize principals' roles without clear, bidirectional and unambiguous communication.

Athanasoula–Reppaa, Makri–Botsaria, Kounenoua i Psycharisa (2010, p. 2207-2212) pointed that in organization such as school, communication is the most important tool for developing excellent relations and school effectiveness as well. Clampitt, (2005) observes that effective leader must have realistic view onto communication and their direct and indirect effects. At the same time, principal must understand the complexity of communication. Witherspoon (1996, p.204) reinforces this argument and adds that leadership exists only through communication. Communication includes verbal and nonverbal message and 90% of interpersonal communication is explained with their nonverbal part (Verderber & Verderber 1998). According to Nilsson and Waldemarsson (1994, p.10), communication is important both through the perspective of psychology and sociology.

Burcar, (2014, p.91), pointed that the principals are involved in following processes: planning, decision making, organizing, coordinating, communicating, influencing and evaluating. Joyce and Coral (2001, p.3-4) from Duke (1988, p.308), extracts principals' role of relation builder through communication. Cooley and Shen, (2003, p.635) observes that 71% of the principals declares that they are engaged in public relation jobs daily or weekly, and 65% of them that they allocate time for communication with staff daily or weekly. Blase, Jo and Blase, Joseph (2002) in their conclusion of the research carried out two the most important communicational tasks for principals: 1. communication with teachers about teaching and 2. Communication with teachers in the purpose of influence on teacher's permanent professional development.

The lack of communication in the school is significant mistake principals make (Bulach, Boothe, & Pickett, 1998, p.16). Teachers, as potential candidates for principals, have wrong perception of principals' jobs, and they do not know what they can expect if they become principals one day (Burcar, 2010, p.261).

Finally, we can conclude that interpersonal relations, education, teaching, management and leadership cannot exist without visible and recognizable communication.

The goal of this research is to examine teachers' attitudes about principals' communicational jobs. To examine whether number of shifts, number of student, teachers' level of education and teachers' daily and weekly workload as well predict their attitudes about principals' communicational jobs in the school. The parenthetic goal of this study is to examine whether gender difference exists in these variables. This goal arisen as idea based on the results that Kochan, Spencer and Mathews (1999) offered. They examined principals' roles in the context of personal job estimation on the sample N=541. Authors suggest that women are mostly orientated toward global business surroundings, for example, need to create a pleasant working environment and relationship, while man are most business/task orientated, which suggests differences in the techniques of reaching management and leadership goals. However, it is important to note that differences in their study are statistically significant on the item level.

2. Methodology

2.1. Participants

According to findings, that there is no statistically significant difference between jobs they perform Croatian elementary and secondary school principals (Burcar, 2013, p.150), the empirical research was carried out on the sample, consist of elementary and secondary schools teachers* from the Republic of Croatia (N=80). They work in ISCED 1, 2 and 3 educational institutions. They fulfills questionnaire with their own will during one of the national conferences for teachers. They belong to expert working group responsible for teacher training expertise. Sample presents 20 men and 60 women. At the moment of examination 3 teachers had high school degree, 57 teachers had high educational level (university degree), 15 of them baccalaurean degree and 5 of them had scientific degree (Master of Science or Doctoral degree). Sample covered different level of education, different gender and both primary and secondary education teachers. We can say that sample is intentional and occasional, representative, very experienced and suitable for this type of study.

2.2. Instruments

Principals' communicational activities were examined with scale designed for this study. Items for the scale have been extracted from instrument for principals' role estimation constructed by Burcar (2010). Designed scale has three subscales; for informing, reporting and verbal communication. Scale contains 33 items with Cronbach alpha reliability coefficient $\alpha = 0.93$ with internal consistency of the variables 0.29 in average, and there is no need for questionnaire reduction. Table 1 provides examples of statements for each subscale.
Each statement in the questionnaire can be agreed from 1 (totally disagree) to 6 (totally agree). The results of three subscales were formed so that the total score (sum of rounded answer) was divided by the number of particles, thus an average scale of assessment was shown for each subscale. Thus, the results of respondents in each of these scales can range from 1 to 6. A higher score on the subscales means a higher level of agreement. Participants also entered data about the number of students and shifts at school in which they work their educational level and their daily and weekly workload expressed in working hours.
Standard statistical methods for homogeneity and dispersion have been used in this research (descriptive statistics, variable testing), as well as T- test for independent sample have been used for testing differences between two samples and regression analyzes for testing prediction of perception about principals managerial and leadership jobs.

* In the text term teacher has been used for both man and woman, except in the part where differences will be explained.

Table 1. Sample of statements for subscales

Subscales	Sample of statements
Attitudes about informing (11 items) INF	«Principal read application and petition. » «Principal informs themselves on the parents meeting. »
Attitudes about reporting (7 items) REP	« Principal report students about events important for them. » « Principal report staff about events important for them. »
Attitudes about verbal communicating (15 items) VCOM	«Principal speaks with students. » «Principal speaks with professional associates. »

2.3. Procedure

Examination was conducted on one of the national conferences organized by HPKZ[1]. Teachers fulfilled questionnaire with their own free will in their free time between classes. Testing took 10-15 minutes per respondent in average.
The participants' task was to indicate to what extent they agree with the statement for each argument in the list of items. The degree of agreement varied from 1 (totally disagree) to 6 (totally agree).
The results of respondents in each of these scales can range from 1 to 6. A higher score on the subscales means a higher level of agreement.
The results are sorted in Excel, a spreadsheet program and processed in Statistica for Windows 4.0. Modules for descriptive statistics, module for distribution testing, t-test and regression analyzes have been used.

3. Results

The results of tested variables show normal distribution of the results (Table 2). Kolmogorov-Smirnov test for variable informing is: d=.0743615, p=n.s., for variable reporting: Kolmogorov-Smirnov d=.0844308, p=n.s., and for variable verbal communicating Kolmogorov-Smirnov d=.0737115, p=n.s.

Table 2. Distribution normality

Tested variable	INF	REP	VCOM
K-S d	0,74	0,84	0,77
P	n.s.	n.s.	n.s.

K-S d – Kolmogorov-Smirnov test for normality; p – level of significance,
n.s. – not significant

Descriptive statistics for tested variables are shown in Table 3. It is obvious that participants work in the school from one to three shifts what is reality in the Republic of Croatia. Teachers work 7.5 hours a day and 39.4

[1] Hrvatski pedagoško književni zbor

working hour a week in average, what is higher result than daily and weekly workload regulated with legislation as a direct contact with students. They work in schools with 582 students in average.

Table 3. Descriptive statistics for subscales of the scale for teachers' attitudes about principals' communicational jobs and data about school size and teachers workload as well (N=80).

Variables	Mean	SD	Min	Max
Informing	4,64	0,76	2,73	6
Reporting	4,81	0,83	3,14	6
Verbal communication	4,64	0,58	3,40	5,93
Working hour/day	7,66	1,76	1	10
Working hour/week	39,41	11,10	7	85
No of shifts	1,81	0,42	1	3
No of students in the school	582,20	268,47	18	1200

Correlations between subscales are shown in table 4. Correlations between subscale results are high and statistically significant what implies the same object of measurement, communication.

Table 4: Correlation matrix

	Reporting	Verbal communication
Informing	.61*	.46*
Reporting	-	.61*
Verbal communication		-

* p<.05

With the T-tests, differences between the men and women on the tested variables have been checked. As it can be seen in Table 5, there is no statistically significant difference between men and women in informing and reporting subscale, but in subscale for verbal communication statistically significant difference exists p<.05 (p=.47).

Table 5: T-test for independent sample

	Male (n = 20)		Female (n = 60)		
	Mean	SD	Mean	SD	T
Informing	4,64	0,78	4,65	0,75	-0,31
Reporting	4,78	0,83	4,82	0,84	-0,19
Verbal communicating	4,42	0,61	4,72	0,56	-2,01*
Communicational job in total	4,57	0,60	4,71	0,59	-0,95

* p<.05

3.1. Regression analyses results

In this study we would like to understand how the level of education, school size, teachers' workload and gender as well, predict teachers' attitudes about principals' communicational jobs in the school. Firstly, the analyses showed that regression of predictors onto principals' communicational jobs is statistically significant on the level p<5% (p=.03132). The multiple correlation coefficient was 0.41 (r=.41), the coefficient of determination is 16.87% (R^2=.1687). In the results forecasting to principals' communicational jobs, highly participate variable: teachers' educational level, which standardized regression coefficient has negative direction -26 (β= -.26; p=.021).

Secondly, we would like to understand how the same variables predict attitudes about principals: informational job, reporting job and job called verbal communication.

The analyses showed that regression of predictors onto principals' informational jobs is statistically significant on the level p<5% (p=.02188). The multiple correlation coefficient was 0.42 (R=.42), the coefficient of determination is 17.92% (R^2=.17918). In the results forecasting to informational jobs, highest participate variable: teachers' weekly workload which standardized regression coefficient is 44 (β=.44; p=.03). Furthermore, in the results forecasting to informational jobs, participate variable; level of teachers' education, as well, which standardized regression coefficient has negative direction -22 (β= -.22; p=.047).

Thirdly, the analyses showed that impact of predictors onto principals' verbal communication is statistically significant with the level of significance p<5% (p=.04386). The multiple correlation coefficient was 0.40 (R=.40), with the coefficient of determination 15,86% (R^2=.1586). In the results forecasting to verbal communication, highest participates variable: gender, with standardized regression coefficient 24 (β=.24; p=.03). Furthermore, in the results forecasting to verbal communication significantly participates variable: teachers' educational level, which standardized regression coefficient, has significant but negative direction -30 (β= -.30; p=.0080).

Regression of predictors onto variables which explains reporting is not statistically significant.

4. Discussion and conclusion

Several conclusions can be drawn from the findings of this research provided on the sample (N=80) which presented 20 male and 60 female primary and secondary school teachers from The Republic of Croatia (ISCED 1, 2 and 3 educational institutions). They work in the schools with 582 students in average. They work in schools with two shifts in average, and their weekly workload is 39.41 hours and daily workload is 7.66 hours in average. In organization such as school, communication is the most important tool for developing excellent relations and school effectiveness (Athanasoula–Reppaa, Makri–Botsaria, Kounenoua i Psycharisa, 2010, p. 2207-2212). Effective leader must have realistic view onto communication and their direct and indirect effects (Clampitt, 2005). Principal must understand the complexity of communication. Leadership exists only through communication (Witherspoon, 996, p.204). Communication includes verbal and nonverbal message.

Through the results of empirical part of this research, it can be concluded that teachers considered that principals' execute communicational job, what is expected because the conclusion offered by Duke (1988) that principal is relation builder through communication, and according to the fact that communication is in contemporary school expected principal's behaving, what is pointed by Ärlestig (2008). Our findings are close to conclusions that principals understand importance of communication as a tool for message distribution and interpersonal relation building explained by Johansson (2003) and function of communication as well, what is concluded by Dimbleby and Burton (1998). It is obvious that principals' communication is visible in Croatian schools, what is close to conclusion offered by Ärlestig, (2007, p. 262) that communication is the most common tool that principals use in daily work. Witherspoon (1996, p. 204) says more clearly: «Leadership exists only through communication». It seems that findings of our research are on the track to conclusion that Croatian

principals understand that the most common principals mistake is a bad interpersonal communication and ineffective interpersonal relations, what is stressed by Bulach, C., Boothe, D., & Pickett, W. (1998., p. 16). Our findings confirm high results in subscales: informing, reporting and verbal communication, what is expected as well, because of the definition that communication understands information transfers for sender to receiver explained by Weihrich and Koontz (1998).

Secondly, high correlation on subscales shows relations between informing, reporting and verbal communication, what leads us to conclusion that all of them belong to area of principals' communicational jobs. We can conclude that there is no statistically significant gender difference on the scale for principals' communicational job, but for verbal communication gender difference is statistically significant on the subscale. This finding surprised us because of the fact that many researches pointed that women's intuition is women's ability for better detection for detail in appearance and behavior and nonverbal communication as well (Sindik, 2008, p. 50).

Thirdly, according to the regression analyses results, it can be concluded that impact of predictor variables: gender, level of education, teachers' daily and weekly workload, number of school shifts and number of student in the school onto attitudes about principals' communication is statistically significant. The highest impact to the result prognosis has teachers' educational level, but with negative direction, what surprised us and it can be one of the goals for future studies.

Furthermore, the regression analyses results on subscales shows us that regression of the same predictors are statistically significant onto teachers' attitude about principals' informational jobs and verbal communication jobs.

In prognosis of informational jobs the biggest influence has variable: teachers' weekly workload, from what it can be concluded that teacher who work longer have better overview onto principals' communicational jobs. Big influence in the prognosis has teachers' educational level as well, but with negative direction. This means that highly educated teacher are worse forecasters of principals' informational jobs, what can be one of direction for future studies.

Further, the results show that a variable gender has higher impact in the prognosis of principals' verbal communication. This leads us to conclusion that women better perceive principals' verbal communication than men. The level of education has high predictive impact in negative direction to verbal communication, what is similar to results extracted for informational jobs.

Findings from our research leads us to comprehension that gender difference about perception of principals' communicational jobs exists on the level of verbal communication and that gender, educational level, and weekly workload are predictors for teachers' attitudes about principals' communicational jobs.

Finally our study confirms teachers' perception about principals' communicational jobs: informing, reporting and verbal communicating. Teachers have attitudes about them because they are visible, what means that principals perform them. Principals are communicators.

All findings can be practically used for principals' lifelong learning system planning and implementation. Communicational trainings will be applicable for principal's permanent education. For future researches it will be wise to include a few more variables, the ways and channels of communication, for example.

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An Optimal Eigenvalue Based Spectrum Sensing Algorithm for Cognitive Radio

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Abstract

Spectrum is a scarce resource, and licensed spectrum is intended to be used only by the spectrum owners. Various measurements of spectrum utilization have shown unused resources in frequency, time and space. Cognitive radio is a new concept of reusing licensed spectrum in an unlicensed manner. The unused resources are often referred to as spectrum holes or white spaces. These spectrum holes could be reused by cognitive radios, sometimes called secondary users. All man-made signals have some structure that can be potentially exploited to improve their detection performance. This structure is intentionally introduced for example by the channel coding, the modulation and by the use of space-time codes. This structure, or correlation, is inherent in the sample covariance matrix of the received signal. In particular the eigenvalues of the sample covariance matrix have some spread, or in some cases some known features that can be exploited for detection. This work aims to implement, evaluate, and eventually improve on algorithms for efficient computation of eigenvalue-based spectrum sensing methods. The computations will be based on power methods for computation of the dominant eigenvalue of the covariance matrix of signals received at the secondary users. The proposed method endeavors to overcome the noise uncertainty problem, and perform better than the ideal energy detection method. The method should be used for various signal detection applications without requiring the knowledge of the signal, channel and noise power.

Keywords—*Spectrum, sensing, detection, eigenvalues, cognitive radio.*

I. Introduction

The electromagnetic radio- frequency spectrum is a highly valuable natural resource, but its use is regulated by governments through licensing agreements. Careful studies on the current usage of the radio spectrum by several agencies reveal that some frequency bands are heavily used; other frequency bands are only partially occupied, while most frequency bands in the spectrum remain largely unoccupied. Spectrum utilization can be improved significantly by making it possible for a secondary user to access a spectrum hole unoccupied by the primary (licensed) user at the right location and time. Cognitive radio, inclusive of Software-Defined Radio (SDR), has been proposed as the means to promote the efficient use of the spectrum by exploiting the existence of spectrum holes.

Cognitive radio is a self-aware communication system that efficiently uses spectrum in an intelligent way. It autonomously coordinates the usage of spectrum by identifying unused radio spectrum on the basis of observing spectrum usage, monitoring parameters in its radio frequency environment and reconfiguring its transmission and reception parameters to enable

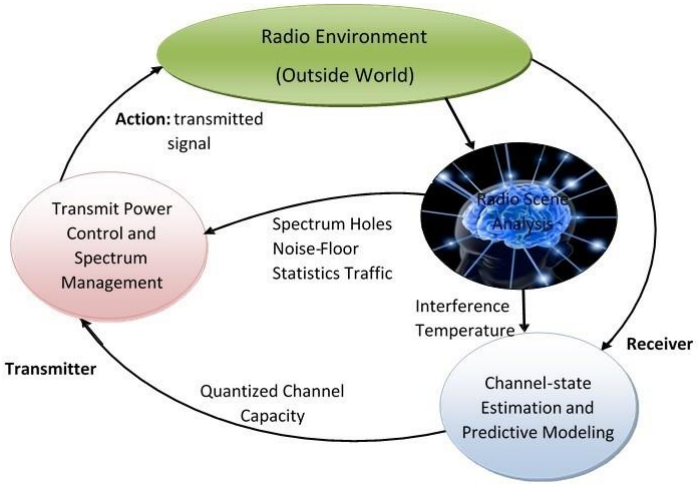


Fig.1. Basic Cognitive Cycle

Efficient communications with reduced interference. The reconfigurability of a cognitive radio is provided by the software defined radio platform, upon which a cognitive radio is built. The most advanced software-defined radio can additionally sense the environment and react appropriately according to the changes in the parameters it has sensed, in real time.

The cognition cycle by which a cognitive radio may interact with the environment is illustrated in Figure 1. Stimuli enter the cognitive radio as interrupts, dispatched to a cognition cycle for a response. Such a cognitive radio continually observes, orients itself, creates a plan, decides and then acts. In addition, learning may be pursued in the background [1].The cognitive process therefore, starts with the passive sensing of RF stimuli and culminates with action.

The introduction of cognitive radios will inevitably create increased interference and thus degrade the quality of service of the primary system. The impact on the primary system, for example in terms of increased interference, must be kept at a minimal level. To keep the impact at an acceptable level, secondary users must sense the spectrum to detect whether it is available or not. Secondary users must be able to detect very weak primary user signals [2][3][4]. Therefore, spectrum sensing is a fundamental component in cognitive radio.

Spectrum sensing is the ability to find available frequencies or timeslots to transmit in. However, there are several factors which make the sensing problem difficult to solve. First, the signal-to-noise ratio (SNR) of the primary users received at the secondary receivers may be very low. Secondly, fading and time dispersion of the wireless channel may complicate the sensing problem. In particular, fading will cause the received signal power to fluctuate dramatically while an unknown time dispersed channel will cause unreliable coherent detection [5][6]. Thirdly, the noise/interference level changes with time which results in the noise uncertainty [4][7]

In spectrum sensing, therefore, the main objective is that of designing an optimal algorithm for exchanging spectrum sensing data between nodes to reliably detect spectral holes for use by the cognitive radio and to reliably detect when the primary transmitter comes on. The problem is then that the algorithm needs to have as little delay as possible so that once channels are available one can transmit immediately and, of course, with as few false detections and false no-detections as possible.

The spectrum sensing functionality can be implemented in either a non- cooperative or a cooperative fashion. Matched filter detection, energy detection and cyclostationary feature detection are three classic non-cooperative spectrum sensing methods. Cooperative spectrum sensing can effectively improve the sensing performance in a fading environment. In cooperative spectrum sensing, local sensors individually sense the channels and then send information to the network center, and the network center makes the final decision according to a certain fusion rule.

Eigenvalue based spectrum sensing methods use the eigenvalues of the sample covariance matrix to detect the primary transmitter without requiring information of primary user signals or noise power level. Eigenvalue

based detection techniques studied in literature include maximum-minimum eigenvalue (MME) detection [18], energy with minimum eigenvalue (EME) detection [17], maximum eigenvalue detection (MED) [20] and maximum eigenvalue to trace (MET) detection [19]. In [13], the simulation and performance for MME detection and EME detection are presented for the Nakagami-m fading channel.

Moreover, in the eigenvalue based methods, the expression for the decision threshold has been derived based on the asymptotic or limiting distributions of extreme eigenvalues. The exact decision threshold is calculated for MME detector in [11]. By using the exact decision thresholds, the detection performance of MME detector achieves significant performance gains. An eigenvalue based spectrum sensing technique with finite number of samples and sensors is proposed in [16]. The authors express the distribution of the largest eigenvalue of finite sample covariance matrix in the form of sum of two gamma random variables.

These eigenvalue-based detectors have been shown to perform well when the signal to be detected is highly correlated. The proposed methods can be used for various signal detection applications without knowledge of the signal, the channel and the noise power. Furthermore, different from matched filtering, the proposed methods do not require accurate synchronization.

However, all of the above eigenvalue based spectrum sensing methods require multiple sensing nodes or receiving antennas. In some networks such as cognitive radio ad hoc networks [9] and cognitive radio cellular networks [12], CR users are mobile and they communicate with each other using small and flexible devices. It is impractical to equip a small mobile device with multiple antennas due to the required size of these antennas. More specifically, the space between two antennas must be at least of the order of $\lambda/2$, λ being the wavelength used for transmissions. For example, for the commonly used 2.4 GHz frequency band, the required distance is 6.125 cm. Even four antennas can be too big to be mounted on a laptop and the situation will get worse for small mobile device [9].

Therefore, this research work addresses the problem of spectrum sensing in a single receiver system. An optimal maximum-minimum eigenvalue detection method using a single antenna is proposed for cognitive radio networks. The temporal smoothing technique is used to form a virtual multiantenna structure for the implementation of proposed detection method based on single antenna. The proposed approach makes use of the power method to obtain the maximum and minimum eigenvalues to avoid the eigenvalue decomposition processing. The decision threshold is derived based on latest random matrix theories.

II. System Model

Assume that the frequency band of interest has a central frequency f_c and bandwidth W. During a particular time interval, the frequency band may be occupied by only one primary user. Several secondary users are randomly distributed in the cognitive radio network. Each secondary user is equipped with a single antenna. In this research work, the non-cooperative spectrum sensing scheme is considered, that is, the sensing work is completed by only one secondary user (only one source, one receiver). For signal detection, two hypotheses can be formulated: (1) hypothesis H_0 : there exists no signal (only noise); (2) hypothesis H_1 : there exists both the signal and additive white noise. The binary hypothesis test can be replaced by:

$$H_0 : x(n) = w(n), \qquad n = 0, 1, \cdots$$
$$H_1 : x(n) = \sum_{k=0}^{N} h(k)s(n-k) + w(n) \qquad (1)$$

Where $x(n)$ denotes the discrete signal at the secondary receiver, $s(n)$ is the primary signal seen at the receiver, $h(k)$ is the channel response, N is the order of the channel, and $w(n)$ are the noise samples. Considering a sub-sample M of consecutive outputs and defining

$$\hat{x}(n) = [x(n), x(n-1), \cdots, x(n-M+1)]^T$$

$$\hat{w}(n) = [w(n), w(n-1), \cdots, w(n-M+1)]^T \quad (2)$$
$$\hat{s}(n) = [s(n), s(n-1), \cdots, s(n-N_1-M+1)]^T$$

This results in

$$\hat{x}(n) = H\hat{s}(n) + \hat{w}(n) \quad (3)$$

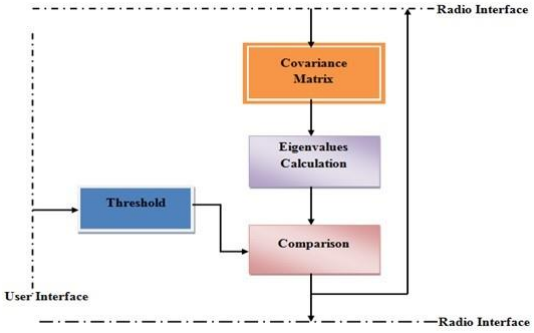


Fig. 2.Eigenvalue-Based Spectrum Sensing Algorithm Flow Chart

Where

H is an M x (N+M) matrix, defined as

$$H = \begin{pmatrix} h(0) & \dots & h(N) & \dots & 0 \\ & \ddots & & \ddots & \\ 0 & \dots & h(0) & \dots & h(N) \end{pmatrix} \quad (4)$$

Considering the statistical properties of the transmitted signal and channel noise,assume that the noise is white and that the noise and the transmitted signal are correlated. Let R be the covariance matrix of the received signal, that is,

$$R = \frac{1}{N_s} \sum_{n=M}^{M-1+N_s} \hat{\mathbf{x}}(n)\hat{\mathbf{x}}^H(n) \quad (5)$$

Where N_s is the number of collected samples. If N_s is large, based on the assumptions made earlier,it is verified that

$$R \approx E[\hat{x}(n)\hat{x}^H(n)] = HR_s\mathbf{H}^H + \sigma_w^2\mathbf{I}_M \quad (6)$$

Where R_s is the statistical covariance matrix of the input signal, $R_s = E[\hat{s}(n)\hat{s}^H(n)]$, σ_w^2 is the variance of the noise, and I_M denotes an $M \times M$ identity matrix.

Let $\hat{\lambda}_{max}$ and $\hat{\lambda}_{min}$ be the maximum and the minimum eigenvalues of R , and $\hat{\rho}_{max}$ and $\hat{\rho}_{min}$ be the maximum and the minimum eigenvalues of HR_sH^H. Then

$$\hat{\lambda}_{max} = \hat{\rho}_{max} + \sigma_w^2 \quad and \quad \hat{\lambda}_{min} = \hat{\rho}_{min} + \sigma_w^2 \quad (7)$$

Obviously, $\hat{\rho}_{max} = \hat{\rho}_{min}$ if and only if $HR_sH^H = \delta I_M$ where δ is a positive number.

Again, obviously, when the primary signal is present $\hat{\lambda}_{max} = \hat{\rho}_{max} + \sigma_w^2$, $\hat{\lambda}_{min} = \sigma_w^2$ and when the primary Signal is absent $\hat{\lambda}_{max} = \hat{\lambda}_{min} = \sigma_w^2$

Hence, if there is no signal, $\hat{\lambda}_{max}/\hat{\lambda}_{min} = 1$; otherwise $\hat{\lambda}max/\hat{\lambda}min > 1$

The ratio of $\hat{\lambda}_{max}/\hat{\lambda}_{min}$ can be used to detect the presence of the primary signal. However, $\hat{\lambda}_{max}$ and $\hat{\lambda}_{min}$ are the estimated eigenvalues.

A. Detection Algorithm Flow Chart

Figure 2 illustrates the main parts of the proposed method. The sampled signal comes from the radio system interface, from which the covariance matrix is built. The eigenvalues of the matrix are the calculated with a

specific algorithm to form a maximum-minimum ratio; with the users threshold settings defined and signal presence detection done through comparison with the eigenvalues ratio.

B. Eigen-analysis of the Autocovariance Matrix

To better explain the detection algorithm, the eigenvalues of the autocovariance matrix is necessary. It is assumed that the random process $x(n)$ is, in a wide-sense, stationary and its linear combinations of m basic components $S_i(n)$ is given by

$$x(n) = \sum_{i=1}^{m} a_i S_i(n) \quad (8)$$

Since the equation observed is $y(n) = x(n) + w(n)$, where $w(n)$ is a complex additive white Gaussian noise sequence with spectral density σ^2, the $M \times M$ autocovariance matrix for $y(n)$ can be expressed as

$$C_{yy} = C_{xx} + \sigma_w^2 \mathrm{I} \quad (9)$$

Where C_{xx} is the autocovariance matrix for the signal $x(n)$, $\sigma_w^2\mathrm{I}$ is the autocovariance matrix for the noise and M is the length of the covariance matrix. Note that if $M > m$, then C_{xx} which is of dimension $M \times M$ is not of full rank.

Now,an eigen-decomposition of the matrix C_{yy} is performed. Let the eigenvalues be ordered in decreasing value with $\lambda_1 \geq \lambda_2 \geq \cdots \geq \lambda_M$ and let the corresponding eigenvectors be denoted as $\mathrm{v}_i, i = 1, \cdots, M$. It is assumed that the eigenvectors are normalized so that $\mathbf{v}_i^H \mathbf{v}_j = \delta_{ij}$ (H Denotes the conjugate transpose). In the absence of noise, the eigenvalues $\lambda_i, i = 1,2, \cdots, m$ are nonzero while $\lambda_{m+1} = \lambda_{m+2} = \cdots = \lambda_M = 0$. Thus, the eigenvectors $\mathrm{v}_i, i =$ $1,2, \cdots, m$ span the signal subspace. These vectors are called *principal eigenvectors* and the corresponding eigenvalues are called *principal eigenvalues*.

In the presence of noise, the eigen-decomposition separates the eigenvectors in two sets. The set $\mathrm{v}_i, i = 1,2, \cdots, m$, which are the principal eigenvectors, span the signal subspace, while the set $\mathrm{v}_i, i = m + 1, \cdots, M$, which are orthogonal to the principal eigenvectors, are said to belong to the noise subspace. It follows that the signal $x(n)$ is simply linear combinations of the principal eigenvectors. Finally, the variances of the projections of the signal on the principal eigenvectors are equal to the corresponding eigenvalues of the covariance matrix. So, the principal eigenvalues are the power factors in the new signal space.

In the next subsection, the real maximum eigenvalue $\hat{\lambda}_{max}$ and minimum eigenvalue $\hat{\lambda}_{min}$ of the covariance matrix of the received signal will be obtained.

C. Power Method

In this section, the power method is exploited in order to calculate λ_{max} and λ_{min} for the detection of the primary signal. This way, the eigenvalues can be obtained by simple algebraic operations. This method reduces computational complexity since the eigenvalue decomposition processing is avoided. It is well known that the power method is an effective method to compute the maximum eigenvalue and the corresponding eigenvector (commonly referred to as maximum eigenvector) for a real-valued matrix B. It is important to note that this method is still very effective even if B is a complex valued matrix. For a complex-valued matrix, we have the following theorem.

Theorem 1: For a Hermitian matrix $\mathrm{B} \in C^{n \times n}$, if it has n linearly independent eigenvectors $\mathrm{b}_1, \cdots, \mathrm{b}_n$(k b_i k_2= 1,*for* $\forall_i \in [1, \cdots, n]$) and its eigenvalues satisfy the following relation $|\lambda_1| > |\lambda_2| \geq \cdots \geq |\lambda_n|$. Let $\mathrm{v}_0 = \sum_{i=1}^{n} \alpha_i \mathbf{b}_i (\alpha_1 \neq 0)$. Take the vector $\mathbf{v}_0$ as the initial vector, and form a vector sequence according to the power of matrix B as follows:

$$\begin{cases} \mathrm{v}_k = \mathrm{B}\mathrm{v}_{k-1} \\ m_k = max(\mathrm{v}_k) = v_{ki} \\ \mathrm{v}_k = \mathrm{v}_k / m_k \quad (k = 1,2, \cdots) \end{cases} \quad (10)$$

Where $\mathrm{v}_k = [v_{k1}, \cdots, v_{kn}]^T$. Then, any one of the following statements are true:

b_1 $max(v_k)$

$\lim_{k\to\infty}$ v_k = _____,*or* lim _____ = λ_1 (11) *max*(b_1) $k\to\infty$ *max*(v_k−1)

Proof: Under the above assumptions, the iteration vector v_k can be written as follows:

$$v_k = \mathbf{B}\mathbf{v}_{k-1} = \mathbf{B}^k\mathbf{v}_0 = \alpha_1\lambda_1^k\mathbf{b}_1 + \alpha_2\lambda_2^k\mathbf{b}_2 + \cdots + \alpha_n\lambda_n^k\mathbf{b}_n$$
$$= \alpha_1\lambda_1^k\left(\mathbf{b}_1 + \sum_{i=2}^{n}\frac{\alpha_i}{\alpha_1}\left(\frac{\lambda_i}{\lambda_1}\right)^k\mathbf{b}_i\right) \quad (12)$$

Since B is a Hermitian matrix, it easy to know that

$$\lambda_i \geq 0 \quad \forall_i \in [1,\cdots,n]$$

that is,

$$\lambda_1 > \lambda_2 \geq \cdots \geq \lambda_n \geq 0$$

Using the above analysis, $\lim_{k\to\infty}\left(\frac{\lambda_i}{\lambda_1}\right)^k = 0$ Therefore, for all sufficiently large *k*, it is clear that

$$v_k = \mathbf{B}^k\mathbf{v}_0 \approx \alpha_1\lambda_1^k\mathbf{b}_1$$

From (10), v_k can be expressed as $v^k = \frac{\mathbf{B}^k\mathbf{v}_0}{max(\mathbf{B}^k\_\_\_\_\_v0)}$. Notice that α_1 6= 0 and v_{ki} = 1 (it is the maximal component defined in (10) for the vector v_k). It can be easily verified that

$$v_k \to \frac{\mathbf{b}_1}{max(\mathbf{b}_1)}$$

$$\frac{max(\mathbf{v}_k)}{max(\mathbf{v}_{k-1})} = \frac{\lambda_1^k max\left(\alpha_1\mathbf{b}_1 + \sum_{i=2}^{n}\alpha_i\left(\frac{\lambda_i}{\lambda_1}\right)^k\mathbf{b}_i\right)}{\lambda_1^{k-1} max\left(\alpha_1\mathbf{b}_1 + \sum_{i=2}^{n}\alpha_i\left(\frac{\lambda_i}{\lambda_1}\right)^{k-1}\mathbf{b}_i\right)} \to \lambda_1 \quad (13)$$

This concludes the proof.

According to theorem 1, the maximum eigenvalue λ_{max} of the covariance matrix R can be solved by the power method. Since only one primary signal is concerned, R has only one maximum eigenvalue, the other $M-1$ eigenvalues are all small eigenvalues. To get a more precise result, the miminum eigenvalue λ_{min} of R is computed as follows

$$\lambda_{min} = \frac{tr(\mathbf{R}) - \lambda_{max}}{M-1}$$

Where *tr*(R) represents the trace of R. Finally, the test statistic of the optimal detector is obtained: = $\lambda_{max}/\lambda_{min}$

D. Computational Complexity

Here, the computational complexity of the power method and eigenvalue decomposition when computing eigenvalues is briefly investigated. $O(n^3)$ is used to represent the order of n^3 multiplications. The eigenvalue decomposition processing solves for the complete set of eigenvalues and eigenvectors of the matrix even if the problem requires only a small subset of them to be computed. For the $n \times n$ matrix B , eigenvalue decomposition calls for $2n^3(t+1)$ real multiplications where *t* is the maximum number of iterations required to reduce a super-diagonal element as to be considered zero by the convergence criterion [14]. Thus the computational complexity of eigenvalue decomposition is $O(n^3)$. The idea of the power method is only to compute the principal eigenvalues and eigenvectors. The method only consists of two main computational steps:

(*a*) Obtaining the iteration vector v_k by computing v*k* = B*vk*−1 (*b*) Computing $v_k = v_k/m_k$ in (10)

Since v_k is an $n \times 1$ vector, the computation of these two steps calls for $4n^2$ and $4n$ real multiplications, respectively. Suppose the number of iterations is *S*, then the total number of real multiplications is $4S(n^2+n)$, that is, the computational complexity of the power method has a lower computational complexity than the eigenvalue decomposition processing when computing eigenvalues.

E. Threshold Definition

In the general model of the spectrum sensing algorithm, a threshold must be determined to compare with a test statistic of the sensing metric in order to sense the presence of a primary user. Consequently, to find the threshold for the statistical test, it is important to study the statistical distribution of the covariance matrix.

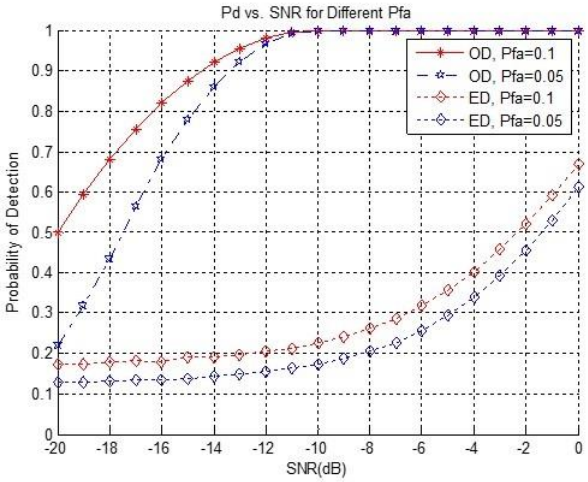
The eigenvalue distribution of R is very complicated [15]. Moreover, there is little or no information about the signal. In fact, it is difficult to know whether the signal is present or not. This in turn makes the choice of the thresholds very difficult. Therefore, in this subsection, random matrix theory is used to approximate the distribution of this random variable and derive the decision threshold based on the pre-defined probability of false alarm, P_{FA}.

When the primary signal is absent,R turns to R_w,the covariance matrix of the noise defined as

$$\mathbf{R}_w = \frac{1}{N_s} \sum_{n=M}^{M-1+N_s} \hat{\mathrm{w}}(n)\hat{\mathrm{w}}^H(n) \qquad (14)$$

R_w is nearly a Wishart random matrix [15].

In recent years, the study of the eigenvalue distributions of a random matrix has become a very hot topic in the fields of mathematics, communication and even physics. The joint probability density function (PDF) of ordered eigenvalues of a Wishart random matrix has been known for many years [15]. However, since the



expression for the PDF is very complicated, no closed form expression has been found for the marginal PDF of ordered eigenvalues. Recently though, researchers have found the distribution of the largest eigenvalue [10] and smallest eigenvalue [8] for real and complex matrices.

Fig. 3.Probability of Detection versus SNR for Different Probability of False Alarm

III. Simulations

In the following section, some simulation results are given using randomly generated signals to illustrate the performance of the proposed optimal detection method.

Consider a licensed frequency band in the cognitive radio network with only one active primary user. The primary signal employs Binary Phase Shift Keying (BPSK) modulation and the center frequency is 8 MHz. the sampling rate is set at 32 MHz. N_s is the number of samples and P is the temporal smoothing factor. The results are averaged over 1000 tests using Monte-Carlo realizations (for each realization, random channel, random noise and random BPSK inputs are generated) written in Matlab.

The SNR of a CR is defined as the ratio of the average received signal power to the average noise power over the licensed frequency band.

$$SNR = \frac{E(||\mathbf{x}(n) - \mathbf{w}(n||^2)}{E(||\mathbf{w}(n||^2)} \qquad (15)$$

The probability of false alarm is required to be $P_{FA} \leq 0.1$, then the threshold is found. For Comparison, energy detection is also simulated with noise uncertainty for the same system. The threshold for energy detection is given in [3]. At noise uncertainty, the threshold is always set based on assumed/estimated noise power.

Figure 3 shows the probability of detection curves for optimal-detection and Energy Detection (ED). The results are taken for $N_s = 100000$ and SNRs varying from $-20dB$ to $0dB$. In the optimal detector, the temporal smoothing factor is 8. As shown in the figure, the proposed optimal-detection method can achieve satisfactory detection performance even in low SNR conditions. For example, the optimal-detection method can detect primary user signals with 99% probability at SNR of $-10dB$. However, the detection probability of ED is less than 70% percent.

From the figure, we can also see that for the same SNR, the probability of detection improves as probability of false alarm

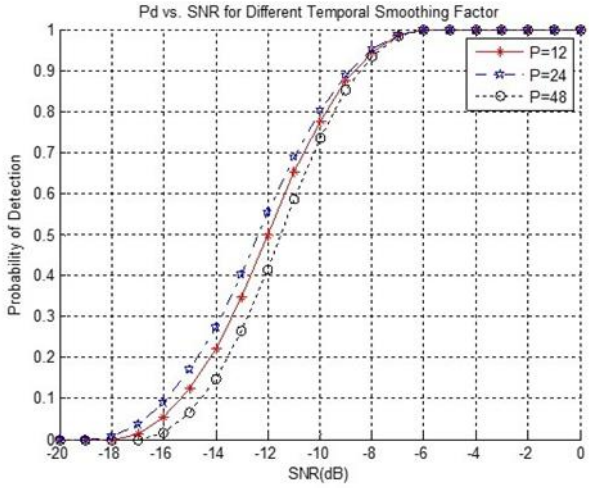


Fig. 4. Probability of Detection versus SNR for Different Temporal Smoothing

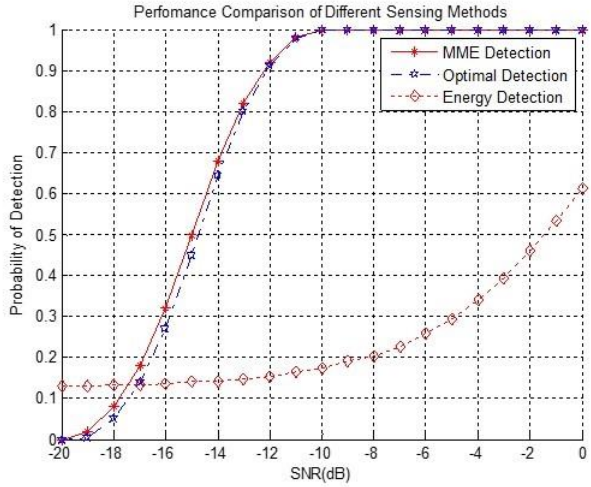


Fig. 5.Performance Comparison of Different Sensing Methods with $P_{FA}= 0.05$

Increases. This reflects the trade-off between false alarm and detection probability. The probability of detection versus SNR for different temporal smoothing factors is shown in Figure 4.

The results are taken for $P_{FA} = 0.1$, and SNRs varying from $-20dB$ to $2dB$. It is shown that the detection performance becomes better when P increases from 12 to 24. However, when P turns to 48, the performance detection declines. Therefore, P should be relatively small while using this technique for a given number of samples.

Figure 5 shows the performance comparison of the optimaldetection technique, the MME detection and energy detection. In MME detection, 4 receiving antennas are used for sensing in the radio environment while the optimal detector has a temporal smoothing factor of 16. For all the three methods, a probability factor of $P_{FA} = 0.05$ is chosen and SNR varied from $-20dB$ to $0dB$.

As shown on the figure, the proposed optimal detection technique performs better than the energy detection method.

Also, it can be observed that both MME detection and optimal-detection can detect the primary user signal with 100% probability when the SNR is more than $-10dB$. The performance of the Optimal-detection technique is very close to that of MME detection when the SNR is less than $-10dB$. For example, the detection probabilities of MME detection and optimal-detection are 0.820 and 0.800 at SNR 0f $-13dB$ respectively.

The biggest performance gap between these two methods is only 0.051 with change in SNR. In other words, the proposed optimal-detection method can achieve roughly the same performance as MME detection by using a single antenna. The main reason for this is that the processed data of these two methods have similar structures. The information about the primary user signal is perfectly contained in the data model of both methods, thus they can achieve roughly the same performance.

In summary, all the simulations show that the proposed method works well without using the information of the signal, channel and noise power. The optimal-Detection technique is always better than the energy detection method. Therefore energy detection method is not reliable since it has a low probability of detection and high probability of false alarm when there is noise uncertainty.

IV. Discussions

It is clearly observed that the fundamental problem of spectrum sensing is to discriminate samples that contain only noise from samples that contain a very weak signal embedded in noise. Cognitive radios must be able to detect very weak primary signals. However, fundamental limits arise during detection at low SNR. For example, to set the decision threshold of the energy detector, the noise variance must be known.

If the knowledge of the noise variance is imperfect, clearly the threshold will be erroneous; that is why it is well known that the performance of the energy detector quickly deteriorates if the noise variance is imperfectly known. However, for the optimal detector proposed here, latest random matrix theories have been used to set the decision thresholds and obtain the probability of detection in order to achieve a good detection performance.

Just like the energy detector, the optimal detection method proposed is universal in the sense that it can detect any type of signal, and does not require any knowledge about the signal to be detected. On the other hand, for the same reason, it does not exploit any potentially available knowledge of the signal.

V. Conclusions

A method based on the eigenvalues of the sample covariance matrix of the received signal has been proposed using a single antenna for cognitive radio networks. A temporal smoothing technique is utilized to form a virtual multi-antenna structure.

In order to calculate the maximum and minimum eigenvalues of the covariance matrix obtained by the virtual multi-antenna structure, the proposed method uses power method. Latest random matrix theories have been used to set the decision thresholds and obtain the probability of detection in order to achieve a good detection performance. Simulations using randomly generated signals are presented in order to illustrate the performance of the Optimal-detection method. It has been shown that the performance of Optimaldetection is very close to that of the MME detection with multiple antennas. The method can be used for various signal detection applications without knowledge of signal, channel and noise power. Besides, the proposed optimal-detection method can reduce system overhead and avoid the eigenvalue decomposition processing by utilizing power method. The energy detector is known for its simplicity of implementing and low complexity. However, its weakest point is that it is not effective under the condition that SNR is an unknown, consequently leading to its unguaranteed accuracy.

The eigenvalue-based technique on the other hand, is not as stable as the cyclostationary technique since its threshold varies greatly as it needs to solve the problem of appropriately estimating the size of the covariance matrix. The advantage of the optimal detector, however, is that it does not require knowledge of the primary user signal and performs better than the energy detector.

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Global Warming And Health Promotions Implications For Public Health Education

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Abstract

All over the world, global warming as a result of climate change is of great concern because of the consequences and implications on health. Therefore, it is a public health issues that require health promotion and prevention, since health promotion is a process of enabling people to increase control over their health and its determinants and thereby improving their health positively and solution for the menace of climate change. The study focused on global warming and health promotion and the implication for public health educators. The concepts related to the issues in climate change where explained for a proper and better understanding of the issue at stake, such as extreme heat events, pollution, water and food borne infectious diseases, radiation, allergies, mental health amongst others. The study also showed the relationship between population and climate, public health education and global warming. The study also revealed some solutions for global warming.

Keywords: Global warming, climate change, health promotion, public health.

Introduction

Global warming can be described as an observed increase in the average temperature of the earth atmosphere leading to climate change and other effects. It is global warming that cause's climate change. According to Anuj (2010) a small rise in temperature (2^0f or 1.1^0c) can have serious effects on climate conditions and weather change. Global warming is a serious concern and it is happening more quickly in some parts of the world than others. A great number of scientists have agreed that global warming is a serious issue growing steadily in bad light.

There are evidence that human activities are responsible for climate change. Stern (2006) emphasized that serious concern on the economic and consequences of climate change is induced by human activities which leads to increase in greenhouse gases and the effects, fossil fuel, increasing population which is one of the greatest factor in global warming, massive rise in the level of greenhouse gases in the earth atmosphere, changes in weather pattern that brings about heavy rains and severe drought, pollution, extreme weather conditions, increasing diseases and animal species dying. This is a serious public health concern and an effective public health response can prevent injuries, illnesses and disasters because climate change poses a public health threat over the coming years and decade and this is likely to have significant impact on health.
Therefore, we require global solution for a huge problem like climate change, this means the whole world working together with scientists collecting, sharing information and government taking action, in order to seek solutions to the problem. The future of the earth now depends on us, efforts are needed at the individual, local, national and international levels to be able to combat the menace of global warming. Climate change has great impact on health, it can affect the health of people through;

- Direct effect of heat.
- Health effects related to extreme weather events.
- Water and food borne infectious diseases.
- Vector borne and zoonotic diseases.
- Emerging pathogens susceptible to weather conditions.
- Allergic and,
- Mental health disorders.

Agarwala (2008) defined climate change as a negative shift in climate balance which has adverse consequences for the ecosystem, human aquatic life and vegetation. Therefore climate change has effect on everything and this is a serious matter. So health promotion is vital here, health promotion has been defined as the process of enabling people to increase control over their health and its determinants and thereby improving their health (World Health Organisation, 2005). And health promotion incorporated public health education and also addresses social factors. Therefore public health education is a major key for empowering people to control human activities that leads to climate change.

Some demograph groups are more vulnerable to the health effects of climate change than others. Children are at greater risk of worsening asthma, allergies and certain infectious diseases, while the elderly are at greater risk due to heat waves, extreme weather events and exacerbation of chronic diseases. People of low socio-economic status are vulnerable and women are also affected because they face gender inequalities which climate change tends to exacerbated. The health effect of climate change on a given community depend not only on a the exposure of the community, but also on how these characteristics interacts, because heat waves are more likely to affect certain population, like the homebound elderly, poor and minority population and those living in the areas with less green space.

Public health education is a major avenue for educating people on how to reduce and control their human activities, cleaner transportation, cleaner energy, eco-friendly homes, preservation of the forest and ocean, saving energy and so on, that lead to climate change. Public health is the practice of protecting and improving the health of the people and the community or a nation and it uses such means as preventive medicine education and control of communicable diseases to respond to health concerns. Public health education empowers people through health promotion and disease prevention.

Related issues in climate change

There are so many factors that affects the health of every individual and the basic ones are heredity, environment and behavior (Money, 2008). These factors operate jointly to determine the quality of health of the individual. The environment is one of the climate change related concepts. The release of harmful chemicals into the environment is a public health concern because these chemicals pollute or make harmful the food people eat, the water they drink and the air they breathe and such pollution increases the risk of health problems.

According to Lucas and Gilles (2003), the environment refers to both the natural and human created environment. The natural environment on its own may create problems for human health as evidenced by temperature fluctuation and therefore natural events as forest fire, tidal waves, and landslides. For instance, a heat wave may result in cases of heat stroke and forest fires will produce smoke resulting in respiratory problems. The created environment also poses much risk to health, for example the slum areas of many cities are in themselves health hazards due to poor housing, ventilation, poor availability of safe water and sanitation. But the good news is that environmental health which is the theory and practice of accessing, correcting, controlling and preventing those factors in the environment that can potentially affect adversely the health of the present and future generation (Fitz Patrick and Kappos, 1999) can help to reduce the menace of climate change in our environment. Anyhow, newspaper articles or television and radio news programmes often feature

reports about our environment and often we see clear evidence that the earth, air, water, land and living things are precious. These natural resources must be protected and each individual can protect the environment in special ways. Humans contribute to the environment just as the environment contributes to humans, for example we breathe out carbon dioxide which plants in turn give off oxygen which human need to breathe and survive, thus a balance of nature is maintained, when any part of the environment is hurt or destroyed this balance is altered.

Natural events are constantly disturbing the balance of nature, human activities of nature and these activities have created waste that have an immediate effect on health. For example oil spill on water can kill the fishes and water fouls living there and if that water is used, humans are affected. People from the oil rich communities in Niger Delta in Nigeria suffer frequently from oil spillages and various health issues thereafter.

Extreme Heat Events

The health effect from these ranges from loss of life and acute trauma to direct effects such as loss of homes, large population displacement and subsequently mental health effect, damage to sanitation infrastructure, interruption of food production and also damage to the health care infrastructure. These could lead to poverty, epidemic, drought, homelessness which are all public health concerns.

Pollution

This is the presence in the air, soil or water substances that are harmful, while pollutant is a substance that creates harmful effects in the air, soil, or water. Examples of pollutants are oil spillages and fumes. Air pollution according to Lucas and Gilles (2006) is a major health problem in both developed and developing world. Increasing amount of harmful gases and particles are being emitted into the atmosphere resulting in damage to human and the environment. Acute respiratory infection (ARI) is one of the most important causes of ill health and death in the developing world and air pollution is considered a very important risk factor in the developing of acute respiratory infection. Air pollution may be divided into anthropogenic (manmade) and natural sources like dust, storms and volcanic action (Lucas and Gilles, 2006).

Climate change may affect air quality by modifying local weather patterns and pollutant concentrations affecting natural sources of air pollution and promoting the formation of secondary pollutant, for example high surface temperature especially in urban areas promote the formation of ground level ozone. Ozone can irritate the respiratory system, reduce the function of the lungs and aggravate asthma and also inflame and damage the cells that line the airways. It may also cause permanent lung damage and aggravate chronic lung diseases. Every day we breathe in air, when the air we breathe in is polluted toxins enter into our body and when this happens frequently, it could damage the lungs. We can be affected by air pollution whether you are out door or indoors. Indoor air pollution can also cause respiratory problems, such as shortness of breathe, a nagging cough, nose and throat irritation and some can cause certain cancer, eye irritation, stomach upset, headache, sleeplessness, depression, dizziness and fatigue.

For the green house effects, many scientists believe that air pollution especially the increase in carbon dioxide in the air is causing greenhouse effect on the earth. A greenhouse is a warm and humid inside with a glass ceiling that traps the heat of the sun. The greenhouse effect is a natural process, but more heat is trapped in the atmosphere as the amount of greenhouse gases increases.

Water and food borne infectious diseases

The world demand for oil and petroleum is high and to meet this high demand more oil and petroleum are transported across the ocean, sometimes tankers carrying this product leak causing oil spills on water. This spills

kills wild life and leave behind carcinogens that can affect human. Altered weather pattern resulting from climate change could affect the distribution and incidence of food and waterborne diseases. Outbreak of cholera, heavy rainfall has also been listed as a contributing factor in the overloading and contamination of drinking water treatment system. This illustrates the need of effective public health surveillance of water and food borne diseases.

Allergies

Warmer weather conditions and higher water concentrations promote the growth of some plants including some that produce allergies. Such effect aggravates symptoms in those who suffer from allergies and asthma.

Mental Health Problems

The aftermath of disasters such as severe weather events may include post-traumatic stress and related problems. This explains the need for a comprehensive public health approach to climate change.

Radiation

Matter is composed of atoms. Some atoms are unstable, therefore as these atoms change to become stable they give off particles called radiation (United States Environmental Protection Agency). Radiation is classified into ionizing and non-ionizing radiations. Over exposure to ionizing radiation can have serious health effects including cancer, birth deformities and mental anguish (WHO, 2000). Cancer is the most significant health risk associated with over exposure to ionizing radiation and this cancer can develop after 10-40 years of exposure (Lucas and Gilles, 2006).

Radiation affects health, it is the transmission of energy in the form of waves, it also occurs naturally in the environment usually people are exposed only to low levels of radiation such as x-rays. Too much radiation may also cause cancer in humans. People who are exposed to high levels of radiation may experience radiation sickness and some of the signs of radiation sickness are stomach upset, vomiting, headache, diarrhea, hair loss and fatigue. This sickness can lead to death.

Effects of Population on the Climate

Problems such as the World growing population, deforestation, solid waste, noise pollution can affect the environment and climate because these problems affect the environment and also affect health. Famine can result from the world's population, that is increasing on a daily basis, many people inhabit the earth, the more automobiles and industries, air pollution will increase and as air pollution increases global warming will increase too while the ozone layer gets thinner. As the ozone layer gets thinner more harmful rays from the sun will get into the atmosphere and with more harmful rays cases of skin cancer will increase.

As the population and the industries have increased, so has noise, noise radiation occur when sound in the environment become too much and too much exposure to loud noise over a long period can cause deafness, it may also cause stress and other related problems as high blood pressure, tension, aggression and fatigue. Deforestation, cutting and clearing trees causes drought and famine because you have to make room for human settlement, planting of crops and grazing of cattle. The earth needs trees to maintain the delicate balance.

In Nigeria we have our own unique environmental problems, and some of the problems are flood, erosion, overcrowdings, bush burning in some parts of the country, capturing of the ocean in Lagos and blocked drainage and gutters and these have resulted in health hazards such as cholera outbreak, epidemics, homelessness, ocean surge and deaths.

The public health educator and global warming

In view of the impact and consequences of global warming as a result of climate change and therefore given the differential burden of the health effects of climate change on certain population, public health preparedness must include assessments to identify the most vulnerable population to global warming and anticipate their risk. At the same time health communication targeting these vulnerable populations must be devised. An effective public health response to climate change can prevent injuries, illness and death. There is no single solution to global warming which is primarily a problem of too much heat trapping carbon dioxide (CO_2), methane and nitrous oxide in the atmosphere. The technologies and approaches outlined below are all needed to bring down the emissions of these gases by at least 80 percent.

Boosting energy efficiency. There should be public health education that the energy used to power, heat and cool our homes, businesses and industries is the single largest contribution to global warming and that technology allows us to use less energy to get the same or higher level of production. This approach has vast potential to save both energy and money.

Green transportation, people must be aware that the transportation sectors emissions have greatly increased and at a faster rate than any other energy – using sector over the past years. Therefore a lot of solutions are at hand, all modes of transport, switching of low carbon fuels and reducing vehicle miles travel and more efficient mass transportation systems.

The public needs to be aware that renewable energy sources such as solar, wind, geothermal and bioenergy are available around the world. Multiple studies have shown that renewable energy has the technical potential to meet the vast majority of our energy needs. Renewable technologies like biofuel can be deployed quickly and it is cost effective, creates jobs while reducing pollution.

Phasing out fossil fuel electricity, reducing our use of fossil fuel especially carbon-intensive coal is essential to tackle climate change. There are several ways to begin the process, and the first step is not building any new coal burning power plant, capturing and storing carbon emissions from power plants, while it sound like science fiction, we have technology that can store carbon emission underground. The technology has not been deployed on a large scale or proven to be safe and permanent but it has been demonstrated in other contexts such as oil and natural gas recovery.

Managing forests and agriculture, we can fight global warming by reducing emissions from deforestation and forest degradation and by making our food production practices more sustainable and exploring nuclear because nuclear power results in global warming emissions, an increased share of nuclear power in the energy could help reduce global warming emissions, an increased share of nuclear power in the energy could help reduce global warming but nuclear technology possess serious threats to our society.

Ensuring sustainable development. According to Olise (2007), the concept of sustainable development has been gaining momentum since the early 1960s with the appearance of articles, books and meetings on the relationship between man and his environment on one hand, and the survival of human race on the other side. The widely accepted definition of sustainable development is that given by the Brundtland Commission; as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. The country of the world, from the most to the least developed vary in their contributions to the problem of climate change and in their responsibilities and capacities to confront a successful global climate change and this must include financial assistance from rich countries to poorer countries to help make the transition to low carbon development pathways and to help adapt to the impact of climate change.

Adapting to changes already underway, as the climate demonstrates the impacts of a warming world, which are already being felt by people around the globe. If climate change remain unchecked, these impacts will get worse from sea level rise to heat waves from extreme weather to disease outbreaks and each unique challenge requires suitable solutions to prepare for and respond to the impact of global warming. Unfortunately those who will be mostly hit by the impact of a changing climate are likely going to be the poor and the vulnerable, especially

those in the less developed countries like Nigeria. Therefore developed countries must take a leadership role in providing financial and technical health for adaptation.

Conclusion and Recommendations

Solutions to global warming in Africa and Nigeria in particular should include an effective land use planning to avoid forest degradation, developing renewable energy and limiting the expansion of coal firing power plants. The African countries have some of the lowerst overall and per capital global warming emissions on the planet, they are also likely to suffer from some of worst consequences of climate change. These impacts may already be unfolding in the form of drought, famine, erosion and population displacement in the context of the high level of poverty and malnutrition, the priority of many African countries to increasing access to energy services and improving the economic welfare of the people. By pioneering new renewable energy projects and establishing forward thinking innovation centers. African countries are looking towards renewable energy as a solution to meet their growing energy needs in a sustainable way, while working towards practical adaptation strategies to reduce the impacts of global warming. Meeting these adaptation and challenges is the responsibility of not only African countries that are facing them, and also developed countries have been the historical responsibility for most global warming emissions while progress is being made, much more needs to be done to address energy needs in the African continent. Therefore in solving global warming we have to harvest in green jobs, cleaner energy, create green homes and building, cleaner's transportation, eco-friendly homes, preservation of forests and oceans and for the future we have to save the earth.

Global warming as a result of climate change, this is the period to act, there is no gain saying that climate change is assuming a critical stage locally, nationally and internationally. Protecting the environment is the responsibility of everyone, government of the world, communities, industries, individuals and laws protecting the environment. For instance scientists are searching for ways to harness solar energy, or energy from the sun. Solar energy is a clean and environment safe energy source. Using it to heat and cool homes could reduce the need for oil, gas and electricity. Even solar energy may one day be used to power some vehicles. Recycling can also be used to reduce solid waste, recycling means reusing materials instead of buying new ones. It saves national resources. Therefore newspapers, cardboard, aluminum, plastics can be recycled. We should always remember the three R^{s} for environmental protection, they are reduce, reuse, and recycle as it will help in no small measure to reduce the effects of global warming as a result of climate change.

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The Challenges of Humanistic Approach to FLT towards Traditional Approach in China

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Abstract

Traditionally, FLT in China attaches too much to the mastery of target language, ignoring learner's personal development in the learning process. *Humanistic teaching voices an objection to the mechanistic, dehumanizing, inhuman emphasis of traditional approaches to education, and a plea for the adoption of new attitudes, concepts and approaches in this area. FLT, as one part of education, has also been influenced by this new force, and requires some innovative approaches to replace the conventional ones in methodology. This paper intends to analyze the big challenges provoked by humanistic teaching towards traditional approach to FLT in China, such as, "student-centered" vs. "teacher-centered"; "process-oriented" vs. "product-oriented"; and "holistic-oriented" vs. "knowledge-oriented" . This detailed analysis is intended to help better comprehend humanistic teaching ideas and provide a new perspective on FLT in China.*

Key words: Humanistic Approach; student-centered; process-oriented; holistic-oriented

Since the 1970s, the appearance of Humanistic teaching has aroused widespread interest of foreign language teachers. People began to turn their attention to the learner's variations in order to find some new ideas which can be more effective in promoting FLT. Humanistic Approach has the following assumptions: The affective aspects of language learning are as important as the cognitive aspects and the learner should be treated in some sense as a "whole-person". This innovative approach has caused a big challenge towards traditional approaches, including three aspects: "student-centered" vs. "teacher-centered"; "process-oriented" vs. "product-oriented" and "holistic-development-oriented" vs. "Knowledge-oriented". People began to see that traditional model violates some of the efficient instruction of language: sufficient opportunity for the creative and truly communicative use of the language and the provision of a rich language acquisition environment. As the antithesis of traditional approach, Humanistic approach provides us with a new perspective On FLT in China.
Teaching has been conventionally defined as "showing or helping someone to learn how to do something, giving instructions, guiding in the study of something, providing with knowledge, causing to know or understand" (Kimble & Garmezy, 1963) [1]. Accordingly, learning is defined as "acquiring or getting knowledge of a subject or a skill by study, experience, or instruction" (Longman Dictionary of Contemporary English). According to Humanistic teaching ideas, however, teaching is guiding and facilitating learning, enabling the learner to learn and setting the conditions for learning. Meanwhile, learning not only includes the learning of skills or the acquisition of knowledge, it also refers to abstract and psychological aspects of learning, such as learning to learn and learning to think, the modification of attitudes, acquisition of interest, social values, or social roles, and even changes in personality. Apart from this change, some other aspects can be summarized in the following table:

Table1: comparison between traditional and humanistic Approach

	Traditional approach	Humanistic Approach
Features	Teacher-centered	Student-centered
	Product-oriented	Process-oriented
	Knowledge-oriented	Holistic-development-oriented

1. "Student-centered" vs. "teacher-centered"

From the historic point of view, humanistic approach can be regarded as a rejuvenation of student-centered theory, which caused a big challenge to traditional teacher-centered teaching approach. As Widdowson (1990: vii) said, "The notion of teacher control is anathema in many quarters. It smacks of prescription and even suggests the suppression of human rights. The view which prevails in many places is one which holds that the description of language use and promotion of language learning should proceed without preconceived ideas, because otherwise the language behavior of real people, users and learners, is cramped into conformity and so misrepresented on the one hand, inhabited on the other. Instead, it is argued, we should let the people speak, as it were, for themselves. If they are learners we should let them find their own natural way as they go, instead of confining them to an itinerary fixed in advance" [2]

As in language teaching, the idea that the teacher should direct the progress of learners has been questioned on the grounds that such direction impedes the natural process of learning in both theoretical and practical domains; therefore, the exercise of authority is seen to result in the artificial manipulation of the actuality of experience. The description of language use is thereby distorted. The development of language learning is thereby disrupted (ibid, 4).

The "teacher-centered" teaching impedes the natural learning process since it does not allow for learner initiative; it does not give the learner scope to draw on the available resources of intuition and inventiveness, or to engage freely the procedures for learning which he or she has acquired through previous experience of language (ibid,181).

Tarlor(1987:85) argues for the need to foster "self-investment" and whole-person goal accomplishment as a condition for effective learning through engagement with communicative tasks. Such an approach, he says, points at the need to maintain a non-authoritarian presence throughout this process so that students can feel secure and non-defensive to enable them to learn not because the teacher demands it of them, but because they need to, in order to accomplish their own goal. [3]

In recent years, great changes have taken place in the English classroom in China. More and more teachers have accepted a learner-centered approach for the effectiveness of classroom teaching (Zhang Fengqin, 2000) [4]. Teachers and students all participate in the teaching and learning process, which breaks down the traditional teaching patterns.

Accordingly, this learner-centered approach can help students use the target language to communicate efficiently within a relaxed atmosphere.

2. "Process-oriented" vs. "product-oriented"

Traditionally, foreign languages have been taught using what is called the product-oriented approach, which is totally teacher-centered and product-focused. The teacher is primarily interested in assessing what comes out at the end, rather than in catering to students' needs and development in the learning process. In recent years, the methodological shift, which has accomplished those trends, has encouraged a focus on interactional competence, the acquisition of core competence (i.e. the ability to cooperate with others, to learn on one's own initiative, etc.) and the development of reflective skills. This necessitates a corresponding shift in classroom-

based knowledge acquisition to skills-based learner competence, and from product to comprehension. FLT should adopt a more "process-oriented" rather than "product-oriented" approach to language learning so as to help people take charge of their own learning process, in that the process-oriented approach caters to a learner's affective domain, establishing the optimal conditions whereby learning can come out about mainly through the learner's own efforts.

As the antithesis of the traditional approach, a humanistic approach with a "process-orientation" is an avant-garde one, having a lot of merits that benefit students. It draws on the rationale of humanistic psychology and attaches importance to affective as well as cognitive aspects. As Widdowson (1990:13) said, "Humanistic approaches are centrally concerned with the actual process of learning and therefore have a bearing primarily on methodology".

3. "Holistic-development-oriented" vs. "knowledge-oriented"

Generally, learners don't know how to do communicative things with what they have acquired as knowledge but simply learn how to display their knowledge according to conventions established by teaching and to meet the requirements of the examinations based on the same conventions. These are traditionally designed to test knowledge of the subject itself as defined by the language teachers, and not what learners have learned to do by means of the subject (ibid,159). In effect, however, apart from language acquisition, there are many other aspects of language instruction which should be considered deliberately. Genesee & Upshur (1996:16) divide the objectives of the foreign language classroom, as the following table shows [5]:

Table2: Multidimensional goals of FLT (created from Genesee & Upshur, 1996:18)

1	Language : language skills
2	Strategic: strategies for communicating, learning and critical learning
3	Socioaffective: changes in learners' attitudes or social behaviors
4	Philosophical: changes in attitudes, values, or beliefs of a more
5	Methods and process: methods, processes, experiences, materials, activities, or other aspects of instruction

From the table above, there are two aspects of FLT. One aspect is concerned with the "person", and the other, "knowledge". The humanistic approach is intended to foster "whole-person" growth, to nourish human relations, and to develop skills mastery in a foreign language. Some researches on a humanistic approach to FLT have proved that given the opportunity to talk about themselves in personally relevant ways, students tend to become much more motivated. The result is that they want to be able to express their feelings and ideas more in the target language. They want to communicate. When this happens, growth becomes a reciprocal process: enhancing personal growth enhances growth in the foreign language (Moskowitz, 1978:4) [6]. So as to better comprehend this reciprocal process, a figure is constructed here:

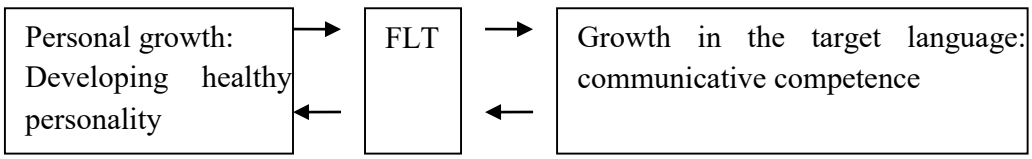

Figure 1: Two dimensions of FLT

Moskowitz (1978:13) describes the relationship between personal growth and foreign language learning:

Suppose the target language is taught so that students develop more positive feeling about themselves and their classmates and find out more about what they are really like. Such an approach will help increase the esteem

and understanding students have for themselves and others, thus facilitating growth in the direction of being more self-actualized. Since self-actualization is such a powerful inherent need in humans, as students see the subject matter as self-enhancing, it will be viewed as relevantly related to their lives. They will then become more motivated to learn to use the foreign language and, as a result, will be more likely to learn.

Learners are seen not so much as full-time linguistic objects at whom language teaching is aimed, but rather as human individuals whose personal dignity and integrity, and the complexity of whose ideas, thoughts, needs, and sentiments, should be respected (Medgyes, 1986) [7]. People begin to see that the traditional model violates some of the conditions of learning found in natural acquisition conditions that are probably necessary for the efficient instruction of language: sufficient opportunity for the creative and truly communicative use of the language and the provision of a rich language acquisition environment.

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Modeling How Shoreline Shape Affects Tides and How Underwater Structures Attenuate Wave Energy: An Example of the Georgia Bight

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Abstract

Two demonstrations are presented that lead students to a greater understanding of ocean tides and wave energy, using the unique tidal range and wave action of the Georgia Bight as an example. The goal is to explain how varying geological features in coastal regions create different wave energies and how the shape of a coastline affects the magnitude of the tidal range. These mechanisms were demonstrated to students in an upper-division college course prior to attending a field trip, in which they would evaluate real-world examples of coastlines with high and low wave energy, and regions with large and small tidal magnitudes. Here, the method of applied learning proved to be successful in guiding students to better comprehension of concepts when relating demonstrations to firsthand observations in the field.

1. Background

Teaching through demonstrations is one way to gain the interest of students while motivating them to form questions and more effectively grasp concepts and understand course material [1]. In addition to lecture and discussion, demonstrations can lead students to a more in-depth understanding, rather than a standard recollection of facts [2]. Here, we develop demonstrations that enable comprehension of what affects ocean tides and wave energy using the unique tidal range and wave energy of the Georgia Bight as an example.

Within the South Atlantic Bight is the Georgia Bight, which spans from the Florida-Georgia border to South Carolina. Along this region, the continental shelf has a shallow slope and extends for about 145 km into the Atlantic [3], which causes an attenuation of the wave energy [4]. Additionally, the concave shape of the coastline increases the magnitude of the difference between high and low tides; this difference is greatest at the center of the Georgia Bight, which can have a tide range reaching 3 meters [5; 4]. In comparison, at the northern and southern edges and outside of the Georgia Bight, tide range is around 0.3 meters [5].

Our goals in these exercises are twofold. First, we want to demonstrate how coastal geology affects wave action and how underwater plants such as seagrasses and mangroves attenuate wave energy in shallow water. Secondly, we want to show that irrespective of wave energy, the magnitude of tidal influence (the difference between high tide and low tide) is impacted by the shape of the coastline. The demonstrations included here illustrate both of these points using hands-on exercises and affordable materials. These exercises were implemented with great success in an upper-division college course on coastal biodiversity in Georgia and Florida.

2. Materials

2.1 To Illustrate the Effects of Tides

- 2 tin foil pans (Dimensions of the pans used in this demonstration were 30 cm x 23 cm x 6 cm. However, other sized pans can be used as long as large enough to easily observe water level.)
- 2 wood pieces to place under and tilt each foil pan (Dimensions of the wood pieces in this demonstration were 5 cm depth and 10 cm width. However, other sizes can be used, but they should match in width to ensure pans are sloping equivalently.)
- 11 kg bag of plaster of paris

2.2 To Illustrate Wave Attenuation

- Large plastic storage container (Dimensions of the container in this demonstration were 1 m x 51 cm x 18 cm. However, other sizes can be used, but wood pieces listed below should be sized to match the length of the smallest axis of the container.)
- Plywood measurement to create continental shelf simulation:
  - Piece 1: 44 cm x 46 cm
  - Pieces 2 & 3: (2) 9 cm x 48 cm
  - Pieces 4 & 5: (2) 9 cm x 45 cm
- Plywood used to create waves and barrier for the plaster of paris during mold of beach slope, Piece 6, measuring 44 cm x 30 cm
- 8 drywall screws to secure continental shelf box, each measuring 2-3 cm
- Power drill
- Ruler
- Measuring cups
- Buckets
- Water
- Duct tape
- Thick grade plastic wrap
- Fishing weights (Small flat fishing weights were used in this demonstration. However, other types can be used, but they should be small/ flat enough as to not impact wave attenuation.)
- Plastic doormat
- Pipe cleaners

3. Methodology

3.1 How Geology of the Coastline Affects Tides

Before beginning the first demonstration, plaster of paris will need to be mixed and poured into the two tin pans. Each pan will need to form a different shaped coastline, one straight and the other curved as shown in Figure 1. The straight coastline can be made by placing a barrier across the middle of the pan, ensuring that it is secure and leak resistant, and pouring the plaster of paris mixture to one side of the barrier. Using a curved shaped barrier, such as the side of a bucket, and then pouring the plaster of paris mixture to one side of the convex barrier, can create the desired curved/concave coastline. Allow both pans to fully dry before removing the barriers. Then, add about 3 to 4 centimeters of water to each tin pan, ensuring that the water levels in each pan are identical.

Before performing the demonstration, ask students what they predict will be the effect of tilting the containers. Allowing the water to move toward the plaster, tilt both pans to the same incline, resting them on bases of equal height. Use a ruler to measure and show students the difference in height of the water accumulated

in the center of the plaster coast for each pan, and again at the edges of the coast near the edge of the pan. Gravitational pull of the water moving toward the plaster is analogous to the effect of the moon's gravity on water causing ocean tides.

There should be a noticeable difference in water level measurements between the flat coastline and concave coastline representations, and also between the center and edge measurements of the concave coastline. The difference is due to an accumulation of water in the center of the concave portion of the plaster, similar to what occurs along the eastern coast of the United States. This demonstration helps to explain the increased magnitude of tidal patterns along the coast of the Georgia Bight.

3.2 How Geology and Underwater Plants Affect Wave Action

First, make the plaster of paris mixture by slowly adding it and stirring into the measured amount of water in the bucket, using slightly more water than the plaster of paris instructions recommend, as the mixture will need to be fairly fluid. Place the plastic container on a flat surface, then use plywood Piece 6, enclosed in plastic wrap, as a barrier. Located about 15 centimeters from the end, the barrier will need to be duct taped in place to avoid movement during setting and to prevent leaking while the plaster hardens. Immediately pour the plaster mixture into the area between the end of the plastic container and the barrier, creating a flat floor on one side of the container about 5 centimeters deep. Once this is dry, another batch of plaster mixture will need to be made. Prop up the empty side of the large container in order to create a slope with the plaster floor portion at the bottom of the slope. Immediately after the plaster mix is prepared, pour the plaster mixture into the corner of the large container, on top of the plaster floor already created, as seen in Figure 2. This should create an even plaster slope with a flat edge at the bottom. This sloped piece represents the "beach" of the coastline.

Next, a box will need to be constructed out of plywood in order to create the simulated continental shelf. Using Piece 1 as the base, screw together Pieces 2 through 5 around the sides of Piece 1, to create a box (See Figure 3). Thereafter, a third and larger batch of plaster of paris mixture needs to be mixed and poured into the box, filling the box about 3-4 centimeters deep (for a total height of 5cm, matching the height of the flat plaster floor previously created). Once it is mostly dried, carefully remove the plywood sides of the box.

Before beginning the demonstration, ask students to predict the difference that inserting a simulated continental shelf will cause when creating waves in the large container. Afterwards, fill the container with water until it is about 10 centimeters deep. There are two different methods to creating waves for this demonstration. The simplest approach utilizes manpower by placing plywood Piece 6 horizontally in the water of the large container on the side opposite of the simulated beach. Hold the plywood piece on each side being sure to use consistent and gentle back and forth movements to create uniform waves. Measure and observe the height of the wave produced against the plaster beach.

Then, carefully insert the simulated continental shelf, placing it in the bottom of the large container and making sure that it abuts the flat area at the bottom of the simulated beach. Additionally, the depth of the water in the large container should be no more than 2 cm above the simulated continental shelf. As before, use the plywood piece at the opposite end of the container to create waves with a consistent back and forth motion. Again, measure and observe the wave height formed against the plaster beach.

The other method of creating waves for this demonstration involves a more complicated process in which a unique motor system has been created to ensure more consistent waves and allowing for less human error. Appendix 1 explains this method in more depth. However, the results should be very similar and show a significantly lower wave height against the plaster beach when the simulated continental shelf is inserted than when it is removed.

Wave energy attenuation is also attributed to underwater plants and/or roots, for example from seagrass beds or mangroves. Seagrass and mangroves play a more important role in wave attenuation in more tropical climates, but their importance in mitigating shore erosion and storm surges are of global importance [6].

Mangroves and seagrass beds decrease wave energy through drag dynamics [7]. To simulate these effects, we cut a plastic outdoor doormat (Figure 4) to fit on top of our plaster of paris continental shelf model, held down with a few fishing weights. The strands of the doormat simulate blades of seagrass. When the experiment is repeated, wave energy is further attenuated and dissipated as the water moves through the faux seagrass bed. Lastly, we created a second plaster of paris continental shelf identical to the first, but as the plaster was drying, students prepared what looked like spiders (with varying numbers of legs) by twisting and tying together pipe cleaners. These were stuck into the wet plaster of paris (Figure 5) and simulate the prop roots of mangroves such as the red mangrove (*Rhizophora mangle*). Again, wave energy is even further dissipated by these simulated mangrove forests, illustrating the importance of mangroves and seagrass beds for attenuating wave energy.

To assess wave attenuation in each of these exercises, visual inspection is sufficient to illustrate the point, but this exercise can be made more quantitative by placing a small ruler along the edge of the clear plastic container that serves as the wave tank. Students can measure wave height (trough to peak) near the wave-generating board, midway through the tank, and near the far end of the wave tank, at a faux shoreline or "beach" (Figure 6).

4. Results

4.1 How Geology of the Coastline Affects Tides

The presentation that utilizes tin pans, one with a curved plaster of paris barrier and the other with a straight barrier, is comparable to the concave coastal shape found in the Georgia Bight and the flat coastline situated along the outside of that area. This demonstration helps to illustrate the increased magnitude of the tide range along the coast of the Georgia Bight due to the shape of the coastline. Tilting the pans with the water traveling towards the plaster is analogous to the pull of the moon's gravity on water, causing ocean tides. In the pan with the concave-shaped plaster, the water accumulates in the apex of the curve, which depicts how the tidal range is greatest at the center of the Georgia Bight coastline.

4.2 How Geology and Underwater Plants Affect Wave Action

The incorporation of a large flat plaster mold, plastic doormat, and twisted pipe cleaners into the demonstration help students to see how the physical characteristics of different coastal floors and existence of underwater plants create different wave energies. The plaster of paris mold formed in the wooden box represents varying ocean floor geography near the coast, similar to the continental shelf off the coast of Georgia. Gradual sloping coasts slowly reduce the energy of the bottom of waves causing the wave to mildly topple over itself, but an abrupt slope causes this reduction of energy in the bottom portion of the wave to occur much more quickly, resulting in a plunging or surging break of the wave [8].

The variances in the waves seen in the demonstration are comparable to the different wave energies created by coastal areas. Those with a continental shelf decrease wave energy before reaching the coast, and those without a shelf allow for higher wave energy as it approaches the coastline. The plastic doormat and twisted pipe cleaners represent underwater vegetation, such as seagrass and mangrove prop roots. These types of plants also aid in wave attenuation as seen in the demonstration by a further decrease of wave height across the simulated continental shelf, when the doormat or pipe cleaners were applied.

5. Conclusion

The Georgia Bight, and its unique mix of low wave energy and high tidal range magnitude, is a globally important and biologically diverse region. Understanding the biological and geomorphological features [e.g., 9] that make this area distinct is an example of teaching science through mechanisms rather than labels. For example, after this experiment students understand why the Georgia Bight has a high tidal range, which is different than memorizing that it does without knowing why. The demonstrations were used to create a knowledge base on this topic prior to a field trip in which students would see real world examples of high and low energy coasts, of regions with high and low tidal range, and of areas with wave attenuation due to seagrass and mangroves. This method of applied learning proved to be successful in leading students to a better understanding of concepts when relating demonstrations to firsthand observations in the field.

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Figure 1. Formation of curved and straight coastline with plaster of paris in tin pans.

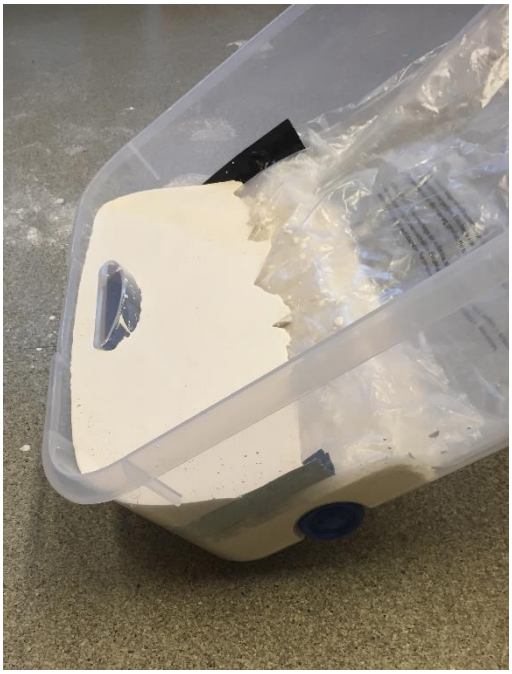

Figure 2. Large plastic container propped up in order to create a slope of plaster of paris poured on top of plaster floor. Placing plastic between the plaster floor already created and newly poured plaster slope is optional if wanting to enable the removal of the sloped portion.

Figure 3. Simulated continental shelf made from plaster of paris poured into constructed wood box.

Figure 4. Plastic doormat affixed to the top of the continental shelf to demonstrate wave energy attenuation of seagrass beds.

Figure 5. Students add twisted pipe cleaners, which simulate the prop roots of mangroves, such as the red mangrove (*Rhizophora mangle*), to the simulated continental shelf to measure their impact on wave attenuation.

Figure 6. Students measure the wave height at three places along the side of the wave tank.

Appendix 1

A wave table such as built here would benefit from an automated method of making waves. Desired parameters of such a wave generation system include production of waves of variable amplitudes and periods. There are a number of such wave generation systems that are available commercially, but they are often pricy and difficult to adapt to our wave table geometry. Here we describe a simple method of creating a wave generation mechanism using easy-to-source parts and a few components that can be built using now ubiquitous plastic rapid prototyping machines.

The practical methods by which commercial systems generate waves seem to be divided into three types. First are gravity fed wavemakers that function by filling a rotating, trough-like container beyond the tipping point in order to introduce a bolus of water into the table. This method is not feasible here as it requires a water flow through system. Second are wavemakers that utilize spinning impellers that turn on and off in a cyclic fashion, and thus produce periodic jets of water that simulate wave action. These wavemakers are designed for use in deep tanks and are a poor choice for wide water tables as they create waves around a point source rather than along a line. Third are wavemakers that produce waves by physical oscillations; such wavemakers include see-saw-like tables that slosh water from one side of the tank to the other or utilize moving walls that physically create compressions and rarefactions in the water column. Our wave generation machine is of this third type; specifically we are describing the use of an armature that raises and lowers a bar into and out of the water to create waves.

The physical construction of our wave generator has three components: the armature, the eccentric cam and the motor/controller. The armature is a beam that represents a third order lever. It is hinged on one end and the bar that raises and lowers into the water is affixed to the other side. Between the two ends, the beam rests on an eccentric pin that is affixed to a rotating gear wheel. The rotating gear wheel teeth mesh with a smaller drive gear in a 3:1 ratio. This drive gear can be driven by a smaller 12 volt DC motor (that can often be inexpensively salvaged from a laser printer, etc.) because of this 3:1 ratio arrangement in which the larger rotates more slowly, but with enough force to raise and lower the beam. These gears were designed in Sketchup and printed out using a rapid prototyper. Those unfamiliar with computer aided design can easily download gears from the thingiverse website or from the supplemental material accompanying this article. The output rotational speed of the motor itself is controlled using a pulse width modulation (PWM) unit capable of delivering a constant voltage while altering the duty cycle. This method of modulating the speed of the motor's rotation is preferable to simply reducing the voltage, because it dramatically lowers the stall speed of the small DC motor. This control can be easily achieved using inexpensive physical computing platforms such as Arduino and its clones, but we chose to use an even more inexpensive single channel PWM control unit that was developed for hobbyists and inventors. Regardless, the PWM unit should a) be able to handle the voltage and current draw of the motor, b) have a potentiometer to control rotational speed, and c) it is useful if it also includes a LCD speed indicator (from stop to 100% duty cycle).

We found this setup to be adequate to generate between 1 and 1300 waves per minute in our tank system.

Ethical Hacking in the Saudi Government Institutions

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Abstract

The Internet has become indispensable to governments by allowing them to conduct E-government, provide better citizen service, improve communications, and access needed information rapidly. While computer networks have revolutionized the way governmental institutions operate, the risks they introduce via interconnectivity can be devastating. Attacks on computer systems via the Internet can lead to lost money, time, reputation, and sensitive information. One reaction to this state of affairs is a behaviour termed "Ethical Hacking" which attempts to proactively increase security protection by indenturing and patching known security vulnerabilities on systems owned by other parties. The main purpose of this study is to address the problems related to the ethical hacking in governmental institutions in Saudi Arabia. The results show that there is a lack of awareness to issues of information security, and ethical hacking, Ethical hacking have a positive impact on the Saudi institutions, and most of ethical hacking problems in Saudi Arabia are related to senior management, staff, society and laws. More researches are needed to consider other measures and include other countries which may show different results.

Keywords: Information security, Ethical hacking, Computer Ethics

1. Introduction

In the age of globalization, people are more dependent on high technology such as the internet and information systems as part of their daily lives. In the realm of government, high technology is promising to enhance the delivery of public goods and services to citizens by using e-government. Although the explosive growth of using high technology in governmental institutes has carried many valuable things: increasing the efficiency of the process and management of government. On the other hand, it raises up some drawbacks concerning the ethics. Most of organizations face several cybercrimes such as criminal hackers. With these concerns and others, the ethical hacker can help. Although ethical hacking is one of today's necessities in the fight against cybercrimes, many people misunderstand what ethical hacking is. Many of the pirating and web corporations became famous such as Anonymous, Wikileaks, and OpIsrael. According to a report from the Al- Arabia Website in November 2009, Saudi Arabia is defined as the most vulnerable Gulf States to attacks of hacking and piracy. It recorded 796,000 cases of malfunctions of computer systems which represents 64% of the total number of cases in the Gulf Cooperation Council [1]. In May 2013, Al- Arabia website have recorded the hacks of several Saudi Ministries and governmental sites, and posted the pictures on their Twitter accounts [9]. According to these statistics, the need to apply ethical hacking in governmental institutions, universities, organizations become a security important requirement. Due to the importance of this subject, a number of researches focus on the study of ethical hacking. Their studies focus on issues like lack of understanding, non-clarification of laws regarding ethical hacker, and non-enforcement of information security standards in various organizations. The aim of this paper is to measure awareness extent of Information security and determine the impact of the ethical hacking on governmental institutions in Saudi Arabia. Survey methodology is used as a base for this research. The rest of this paper is organized as follows:

Section 2 describes ethical hacking. Section 3 illuminates literature review. Section 4 shows methodology. Section 5 is results and discussion. It end with conclusion in Section 6.

2. Ethical Hacking

Ethical hacking is an assessment to test and check an information technology environment for possible weak links and vulnerabilities. Ethical hacking describes the process of hacking a network in an ethical way, therefore with good intention [2]. Ethical hacking plays an important role in evaluating the information security of organizations by giving a pointer for organizations to weaknesses in their systems to prevent security breaches. By this way, ethical hacking increases the empowerment of information security of these organizations and enables them fighting E-terrorism and supporting the national security [5, 8]. There are two groups of ethical hackers: White-hat hackers and black-hat hackers. White-hat hackers are those who are usually security professionals with a knowledge of hacking and the hacker toolset. They use their knowledge to trace weaknesses. It is critical for them to get permission prior to beginning any hacking activity [3]. In contrast, the black-hat hackers use their skills and abilities to invade the privacy or intellectual property of others, breach systems, or destroy them. They use the same methods and techniques of White-hat hackers. They frequently do that out of political, social, religious, or cultural reasons.

An ethical hacker's evaluation of a system's security seeks answers to three basic questions: 1) What can an intruder see on the target systems? 2) What can an intruder do with that information? 3) Does anyone at the target notice the intruder's attempts or successes? [2].

3. Literature Review

Prior research has identified several important issues regarding ethical hacking. This prior focus on issues like lack of understanding what is the hacking and its types, non-clarification of laws regarding ethical hacker, and non-enforcement of information security standards in various organizations.

[2] Describe what ethical hacking is, what it can do, an ethical hacking methodology as well as some tools which can be used for an ethical hack. They suggest that an ethical hackers do not need to hide his traces as he is testing the client environment comprehensively.

[6] Show that ethical hacking is nothing new. It has been an accepted term in the world of information security for quite some time. They mention that ethical hacking provide a unique solution to secure the client networks. Furthermore, they indicate that no security plan guarantee success, and without management support, failure is guaranteed. [6] Figure out after organizations have identified risks, enlisted services, and digested the results of ethical hacking activities, remediation efforts must be planned and engaged. They find out that maintaining security is dynamic and flexible process.

[4] Try to differentiate between a criminal hacker and an ethical hacker. They demonstrate how the ethical hack strengthen the security of the overall systems environment. They notice that there is so much confusion surrounding what makes hacking ethical and unethical and its subsequent legal treatment.

[5]Investigate the method of how to help keep ethical hacking, ethical. Also, they discusses how much can we trust ethical hackers? They explain the idea of teaching people how to hack systems becomes ethical issue and on the ethical considerations for teaching ethical hacking. They identify that none can ever be certain of the intentions of someone else, so the blame cannot reside with the teacher. Moreover, they indicate that none can prove if it is ethical to teach people how to bypass these physical security measures because their skills are necessary when used ethically. They suggest using different models to monitor employees closely to reduce the risk of impact. It can also decrease the impact by identifying implications early enough to help reduce the impact of confrontation.

[10] Aim to report the profile and the individual opinions of the students of Alexander Technological Institute in fundamental ethical and social principles. They show that the students faced some issues when it comes to ethics and social responsibility, this was due to: students lacked the critical thinking skills, which helps them

to make better choices. They recommend that a separate course in Ethics would substantially raise the chances of more ethical awareness amongst the IT students.

4. Methodology

This study aims at assessing the study samples awareness extent of Information security, illustrate the concept of ethical hacking knowledge, shows the impact of the ethical hacking, also, list the problems of ethical hacking from the study sample point of view.

Four educational organizations were included in the study: King Abdul Aziz University, King Saud University, King Fahd University of Petroleum and Minerals, and King Abdullah University of Science and Technology. Five non-educational organizations were included in the study: Jeddah Municipality, Riyadh Municipality, Saudi Arabia Airlines, the Ministry of Communications and Information Technology, Communications and Information Technology organization. These organizations represent the most important organizations in different regions in Saudi Arabia: Central Region, Western Region and Eastern Region. Researchers wanted to distribute the questionnaires in Saudi ARAMCO, which considered one of the most important organizations in the Kingdom of Saudi Arabia based in the Eastern region to become there is convergence between the numbers of organizations according to the zone. The IT manager had been addressing, who showed his willingness but the rejection came from the Department of Public Relations of the organization do not allow the distribution of questionnaires in Saudi ARAMCO.

A random sample of 303managers and employees from information technology and information security departments was gathered, 226 for non-educational sector and 75 for educational sector. The determining Sample Size from a Given Population table was used to determine the size of the sample to be withdrawn from the target community [7].

The survey questions aimed to know the targeted samples' perspective and their view regarding the systems used in their companies. A survey questionnaire consists of three basic parts as follows: Part I, which aims to gather demographic information on the respondents such as name, specialization, position, and years of experience. Part II aims to collect general information about ethical hacking in the organization. Part III aims to achieve the objectives of the study and answer its questions. this part contains four dimensions which comprise 43 items that will be measured using a five-point Likert scale, where (1) strongly disagree, (2) disagree, (3) Not sure, (4)agree, (5)strongly agree. (See Appendix 1 for more details).

Participated organizations categorized as educational sector and non-educational sector. Educational sector includes King Abdul Aziz University, King Saud University, King Fahd University of Petroleum and Minerals, and King Abdullah University of Science and technology. Non-education sector includes Municipality of Jeddah, Municipality of Riyadh, Saudi Arabian Airlines, Ministry of Communications and Information Technology, and Communications and Information Technology organization.

Test of questionnaire study stability was conducted by Alpha Cronbach's lab for each axis of the Study axes.

5. Results And Discussion

The survey results analyzed using the statistical program SPSS version11.The 303 questionnaires gathered from sample. Two samples excluded because the answers are not completed. As a result, the total number of sample become 301.

The result of first part of the questionnaire clarify that (33.6%) of education sector respondents in contrast, (82.7%) of non-education sector are specialized. According to years of experience, the percentage of who have five years or less of experience is came (48.7%) for education sector in contrast, (32%) non-educational sector.

The second part of the questionnaire, clarifies that the percentages of respondents in the both sectors, who have agreed of the existence a specialized section for information security, is (75.2%) and (90.7%)

respectively of the total respondents and this is important for all organizations. The respondents in the educational and non-educational sectors are not sure of the existence of a ethical hacking in the organization by (60.6%) and (50.7%) respectively. In the educational sector, (54.5%) of respondents who answered 'yes', confirm that ethical hacker outside the organization, while non- educational sector percentage is (3.33%.). The majority of his answers were not sure that the organization is performing hacking testing that in educational and non-educational sectors with percentages (67.7%) and (56 %) respectively.

The following is the third part which shows the sample answers to the following four axes: information security, the concept of ethical hacking, its impact and its problems.

Information Security

Table[1] shows the sample responses about information security phrases axis in the educational & non-educational sector.

	Educational		Non-educational	
Degree staff feedback	Repetition	Percentage%	Repetition	Percentage%
Strongly Disagree	12	5.2	–	–
Disagree	39	17.3	3	4.0
Not sure	58	25.7	20	26.7
Agree	82	36.3	41	54.7
Strongly agree	35	15.5	11	14.6
Total	226	100.0 ٪	75	100.0 ٪

Table 1: The responses about information security in the educational & non-educational sector

From table 1, it is clear that the proportions of respondents who have sufficient information security in the education sector and non-educational (51.8%) and (60.3%), which is low for the staff of information technology and information security in organizations.

Concept Of Ethical Hacking

Table [2] shows the sample responses about concept of ethical hacking phrases axis in the educational & non-educational sector.

	Educational		Non-educational	
Degree staff feedback	Repetition	Percentage %	Repetition	Percentage%
Strongly Disagree	2	0.9	–	–
Disagree	13	5.8	3	4.0
Not sure	105	46.5	25	33.3
Agree	96	42.4	45	60.0
Strongly agree	10	4.4	2	2.7
Total	226	100.0 ٪	75	100.0 ٪

Table 2: The responses about ethical hacking in the educational & non-educational sector

Table 2 shows that educational and non-educational respondents answered towards the concept of ethical hacking awareness is (46.8%), and (62.7%).Whilst (46.5%) and (33.3%) not sure.

Table 1 and 2 show that a proportion of specialists in both sectors do not have the awareness and knowledge of the existence of a specialized section for information security and the ethical hacking.

The organization has a defect in the conduct of tests, or it does not educate or alert the staff and users when doing these tests. Lack of awareness among managers and staff of the issues of information security and ethical hacking and conduct of tests, therefore there is a great lack of awareness in society in general. The lack of awareness of ethical hacking is due to the novelty of its conception and not discussed in studies and researches in the Arab world, particularly in Saudi Arabia, and that the organizations may deliberately hide dealing with this technique in information security.

Effect Of The Ethical Hacking

Table[3] shows the sample responses about effect of the ethical hacking Phrases axis in the educational & non-educational sector, terms that E1, E2, ... explain numbering of questionnaire phrases.

	Educational			Non educational		
Phrases	The weighted average	Weight percentile%	Order	The weighted average	Weight percentile%	Order
E1	3.79	69.75	2	4.20	80.00	1
E2	3.76	69.00	3	3.87	71.67	3
E3	3.61	65.25	4	3.76	69.00	4
E4	3.57	64.25	5	3.76	69.00	5
E5	3.86	71.50	1	4.17	79.33	2
E6	2.97	49.25	7	3.32	58.00	6
E7	3.10	52.50	6	3.05	51.33	7
E8	2.96	49.00	8	2.81	45.33	8

Table 3: The responses about effect of the ethical hacking in the educational& non-educational sector

The above table 3, shows that clarifies the effect of ethical hacking in the educational & non-educational sectors that were ranked as the mentioned in the table. The educational and non-educational sectors agreed that the rankedE1 and E5 phrases are the most influential. It is considered the most important positive effects on the organization.

Ethical hacking has a positive impact on organizations, the most important impacts are: Ethical hacking makes employees more aware in dealing with information security issues. Ethical hacking is considered one of the most important techniques used to ensure the security of the organization. Ethical hacking increases the credibility of the organization. Ethical hacking enhances the commitment to the client. Ethical hacking increases the competitive advantage to the organization.

Problems Of Ethical Hacking

Table[4] shows the sample responses about problems of the ethical hacking Phrases axis in the educational & non-educational sector, terms that P1, P2, ... explain numbering of questionnaire phrases.

	Educational			Non educational		
Phrases	weighted average	Weight percentile%	Order	weighted average	Weight percentile%	Order
P1	3.45	61.25	2	3.33	58.25	1
P2	3.16	54.00	6	3.04	51.00	5
P3	3.49	62.25	1	3.33	58.25	2
P4	3.40	60.00	4	2.84	46.00	6
P5	3.38	59.50	5	3.17	54.25	4
P6	3.42	60.50	3	3.27	56.75	3

Table 4: The responses about problems of the ethical hacking in the educational& non-educational sector

The above table 4, shows clarifies the ethical hacking problems in the educational & non-educational sectors that were ordered as the mentioned in the table.
Educational and non-educational sector agreed on that the most important ethical hacking problems affecting organizations in Saudi Arabia are the phrases No. P1, P3, and P6, respectively. While respondents of non-educational sector phases No.2,4 are not considered a problem of ethical hacking in organizations. This applies with practice, where the possibilities of non-educational sectors outweigh the educational sectors.
Concludes from the above, the most important problems of ethical hacking in the educational and non-educational sector in Saudi Arabia are those relating to senior management, staff, society and laws.

6. Conclusion

Governments, companies, and private citizens around the world are apprehensive to be a part of this revolution, but they are afraid that some hacker will break into their Web server and replace their logo with pornography, read their e-mail, steal their credit card number from an on-line shopping site, or implant software that will secretly transmit their organization's secrets to the open Internet.
This study aims to discuss the ethical hacking and its issues and influence on information security in governmental entities in Saudi Arabia. Nowadays, Saudi governments have become more dependent on the information systems. The benefits of the development of this system enormous, including access to high-efficiency organizations, improve communication with customers, services, and the quality. Also, it increases the competitiveness of countries power.
The result of this study shows the lack of awareness for managers and officials of information security. Also, it finds that ethical hacking has a positive influence on the organizations, as the sample individuals picked from the organizations have agreed on two impacts; it makes managers and officials more aware of information security issues, and that it's one of the most important techniques used to ensure the security of the organization. In addition, it figures out that one of the main problems of ethical hacking within educational and non-educational organizations are related to the lack of senior management, staff, and society awareness.
This study confirms that in both educational and non- educational sectors, there is a lack of information security awareness among employee. Also, the years of experience in the sectors are less than five years for most of employees.

It's noticeable that the education sectors hire security specialist's more than administrative cadres in information technology. Moreover, that clears that non –educational sector already have information security specialists. This explains why government educational sectors are typically dealing with competent foreign

companies and organizations for testing their system using ethical hacking. And as for a non- educational governmental sector that provides services or products, they depend on staff from within the organization. There is lack of awareness of managers and staff to issues of information security, ethical hacking and performance tests.

The educational and non-educational sectors response agreed that phrases as follow: ethical hacking one of the most important techniques used to ensure the organization information security and applying ethical hacking in the organization makes employees more aware to deal with information security issues, are the most important positive effects on the organization.

Educational and non-educational sector agreed on that the most important ethical hacking problems affecting organizations in Saudi Arabia are these phrases respectively, Problems related to senior management, Problems related to staff, laws, and society. While respondents of non-educational sector a Problems relating to the capabilities of the organization, and Problems relating to implementation, are not considered a problem of ethical hacking in organizations. This applies with practice, where the possibilities of non-educational sectors outweigh the educational sectors.

The percentage of respondents in the educational and non-educational sectors in general is not sure with their big percentage in most phrases; this confirms what has already been mentioned, a lack of awareness among managers and staff information technology and security departments in the organizations in the information security issues.

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APPENDIXES

Appendix1

- **First part :**

1. (Name(optional .....

2. Specialization

○Computer Science ○Computer Engineering
○Information Security ○Information Systems
Other○

3. Position

○IT Manager ○Employee in IT department
○IS Manager ○Employee in IS department
○ Ethical hacker ○ other

4. Experience years

○ Less than five ○ 5 - 10
○ 11 - 20 ○ More than 20

- **Second part :**

1. Does the organization have information security department?

○ Yes ○ no

2. Does the organization have an ethical hacker?

○ Yes ○ no ○ Not sure

3. If the answer to the previous question is (yes), are ethical hacker from inside or outside the organization?

○ Inside the organization ○ outside the organization

4. Does your organization perform hacking testing?

○ Once a year ○ More than once a year
○ None ○ Not sure

- **Third Part :**

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree
Information security					
You have enough knowledge about information security					
You have a full knowledge about the legislation and the laws regarding to information security					
There are big threats to the governmental organizations in security information					
Security procedures in the organization are sufficient to ensure information security					
The organization has clear policies for information security					
Concept of ethical hacking					
You have sufficient knowledge about the meaning of ethical hacking					
There is a difference between the ethical hacking and unethical hacking					
Monitoring the employees activities by their managers via his PC's considered ethical hacking					

One of the most important objectives of ethical hacking is detected system loopholes and promote level the organization security					
Ethical hacker does not fix the security weaknesses					
Ethical hacker has the rights to access all information in Organization					
Ethical hacker should contract with organization before starting his work					
Effect of the ethical hacking					
Ethical hacking one of the most important techniques used to ensure the organization information security					
Ethical hacking increases organization reliability					
Ethical hacking enhances the client obligation					
Ethical hacking increases the competitive advantage of the organization					
Applying ethical hacking in the organization makes employees more aware to deal with information security issues					
Your organization got (ISO) after applying ethical hacking					
Hacker can access unauthorized organization's resources					
Misuse of information by ethical hacker					
Problems of ethical hacking in your organization					
lack of IS senior management awareness about the importance of ethical hacking					
Information security officials are with poor experience regarding the ethical hacking legal and administrative procedures					
Ethical hacker doesn't have sufficient knowledge & experience					
The higher cost to hire professional ethical hackers in the organization					
Instructions and legal contracts between ethical hacker and organization are not clear					
Loss of confidence in the ethical hacker					
The system and services failure for a period of time					
Lack of specialists in ethical hacker					
The organization does not have management risk assessment					
Infrastructure that supports information technology in the organization is poor					
Current system is not updated continuously					
Size of the organization does not encourage the use ethical hacking					
The organization lacks the alternative plans to deal with the crisis					

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree
Information security					
You have enough knowledge about information security					
You have a full knowledge about the legislation and the laws regarding to information security					
There are big threats to the governmental organizations in security information					
Security procedures in the organization are sufficient to ensure information security					
The organization has clear policies for information security					
Concept of ethical hacking					
You have sufficient knowledge about the meaning of ethical hacking					
There is a difference between the ethical hacking and unethical hacking					
Monitoring the employees activities by their managers via his PC's considered ethical hacking					
One of the most important objectives of ethical hacking is detected system loopholes and promote level the organization security					
Ethical hacker does not fix the security weaknesses					
Ethical hacker has the rights to access all information in Organization					
Ethical hacker should contract with organization before starting his work					
Effect of the ethical hacking					
Ethical hacking one of the most important techniques used to ensure the organization information security					
Ethical hacking increases organization reliability					
Ethical hacking enhances the client obligation					
Ethical hacking increases the competitive advantage of the organization					
Applying ethical hacking in the organization makes employees more aware to deal with information security issues					
Your organization got (ISO) after applying ethical hacking					
Hacker can access unauthorized organization's resources					
Misuse of information by ethical hacker					
The slowness handling of the crisis					
No information backup to be used in case of crisis					
Previous crisis management programs are not evaluated to improve them for future					

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree
Information security					
You have enough knowledge about information security					
You have a full knowledge about the legislation and the laws regarding to information security					
There are big threats to the governmental organizations in security information					
Security procedures in the organization are sufficient to ensure information security					
The organization has clear policies for information security					
Concept of ethical hacking					
You have sufficient knowledge about the meaning of ethical hacking					
There is a difference between the ethical hacking and unethical hacking					
Monitoring the employees activities by their managers via his PC's considered ethical hacking					
One of the most important objectives of ethical hacking is detected system loopholes and promote level the organization security					
Ethical hacker does not fix the security weaknesses					
Ethical hacker has the rights to access all information in Organization					
Ethical hacker should contract with organization before starting his work					
Effect of the ethical hacking					
Ethical hacking one of the most important techniques used to ensure the organization information security					
Ethical hacking increases organization reliability					
Ethical hacking enhances the client obligation					
Ethical hacking increases the competitive advantage of the organization					
Applying ethical hacking in the organization makes employees more aware to deal with information security issues					
Your organization got (ISO) after applying ethical hacking					
Hacker can access unauthorized organization's resources					
Misuse of information by ethical hacker					
Low use of original software and licensed					
Organization ethical values is not documented					
The organization does not encourage employees to devise new security solutions					

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree
Information security					
You have enough knowledge about information security					
You have a full knowledge about the legislation and the laws regarding to information security					
There are big threats to the governmental organizations in security information					
Security procedures in the organization are sufficient to ensure information security					
The organization has clear policies for information security					
Concept of ethical hacking					
You have sufficient knowledge about the meaning of ethical hacking					
There is a difference between the ethical hacking and unethical hacking					
Monitoring the employees activities by their managers via his PC's considered ethical hacking					
One of the most important objectives of ethical hacking is detected system loopholes and promote level the organization security					
Ethical hacker does not fix the security weaknesses					
Ethical hacker has the rights to access all information in Organization					
Ethical hacker should contract with organization before starting his work					
Effect of the ethical hacking					
Ethical hacking one of the most important techniques used to ensure the organization information security					
Ethical hacking increases organization reliability					
Ethical hacking enhances the client obligation					
Ethical hacking increases the competitive advantage of the organization					
Applying ethical hacking in the organization makes employees more aware to deal with information security issues					
Your organization got (ISO) after applying ethical hacking					
Hacker can access unauthorized organization's resources					
Misuse of information by ethical hacker					
The organization Staff don't have enough information about social engineering					
The staff do not accept accessing their personal information by ethical hacker					

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree
Information security					
You have enough knowledge about information security					
You have a full knowledge about the legislation and the laws regarding to information security					
There are big threats to the governmental organizations in security information					
Security procedures in the organization are sufficient to ensure information security					
The organization has clear policies for information security					
Concept of ethical hacking					
You have sufficient knowledge about the meaning of ethical hacking					
There is a difference between the ethical hacking and unethical hacking					
Monitoring the employees activities by their managers via his PC's considered ethical hacking					
One of the most important objectives of ethical hacking is detected system loopholes and promote level the organization security					
Ethical hacker does not fix the security weaknesses					
Ethical hacker has the rights to access all information in Organization					
Ethical hacker should contract with organization before starting his work					
Effect of the ethical hacking					
Ethical hacking one of the most important techniques used to ensure the organization information security					
Ethical hacking increases organization reliability					
Ethical hacking enhances the client obligation					
Ethical hacking increases the competitive advantage of the organization					
Applying ethical hacking in the organization makes employees more aware to deal with information security issues					
Your organization got (ISO) after applying ethical hacking					
Hacker can access unauthorized organization's resources					
Misuse of information by ethical hacker					
There are no procedures for authorizing computer room access					
There is no specified procedure about using information system after official work hours					

A Study of the Applications of Multiple Rhetorical Skills to Reports Regarding Exhibition Centers

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Abstract

The culture of exhibition centers expands people's view of life. Colorful reports can grab visitors' attention and recognition and may influence their motivation to visit. For a report to achieve vividness, the application of rhetorical skills is the key. Thus, this study aimed to explore the applications of multiple rhetorical skills to print media reports. The research method adopted was the qualitative research method. Throughout the analyses, this study found a combination of rhetorical skills to be relevant. The expected effect of this study is to help students in communication related departments to apply rhetorical skills to the practical writing of reports.

Key words: exhibition center, report writing, rhetoric

Introduction

The culture of exhibition centers can help people view life from a variety of new perspectives and improve their taste in leisure time. Writing a vivid and interesting report regarding an exhibition center is not only a central concern of the exhibition center, but also it is an important learning issue for students in communication related departments who will shoulder the social responsibility of media in the future. This study aimed to explore how to teach students to write vivid and true-to-life reports and improve their design ability in their writing.

Thus, this study analyzed a combination of multiple rhetorical skills to describe the appearance of the center based on the content of the 88th issue of "Az Travel" regarding the Shanghai World Expo Exhibition & Convention Center. This study analyzed a combination of two or more rhetorical skills, for the purpose of improving students' flexibility in design and applications. The essence of rhetoric is the art of textual expression. It helps to make descriptions livelier with higher aesthetics (Lin, 1981).

This study selected sentences with two or more rhetorical skills because the purpose is to train students to think in a more diversified way to write outstanding reports without being limited to applying only one single rhetorical skill at a time. Moreover, various aspects of the center can be reported. Yet, this study focused on the reports regarding the appearance of the center, stressing the innovation and practical applications of rhetorical concepts. Thus, only the results of sentences with two or more rhetorical skills were presented. The goal was to help readers learn more about combinations of rhetorical skills as the basis for creative report writing.

According to the literature review, to date a study on the rhetorical analysis of reports regarding the appearance of an exhibition center has yet to be conducted. Therefore, this study performed preliminary research on applications of multiple rhetorical skills to help readers learn more about rhetorical concepts. Imitation is a way to describe based on senses (Wu, 2000). Repetition is to use the same character repeatedly (Shen, 1995). Parallelism means using different words in a similar structure (Li & Chang, 1993). Exclamation is a convention to express emotions through words (Huang, 1997). Conversion describes by converting properties of a person or an object (Chen, 2003). Figure of speech is a way to describe using an example (Guan, 1993). Antithesis is a skill to describe the contrary (Dong, 1994). Manifestation means to describe using a concept across time and

space (Huang, 1999).

After readers understand the simple rhetorical concepts above, they can work on their own creative writing based on the combinations of rhetorical skills under the research results of this study. For example, they can combine three rhetorical skills, imitation, figure of speech, and conversion. Thus, this study stressed applications of combinations of rhetorical skills rather than analyzing an example. The researcher gave the following example of creative writing: "the appearance of the exhibition center at night is like a brave warrior guarding his homeland." Figure 1 shows the analysis of the rhetorical skills applied.

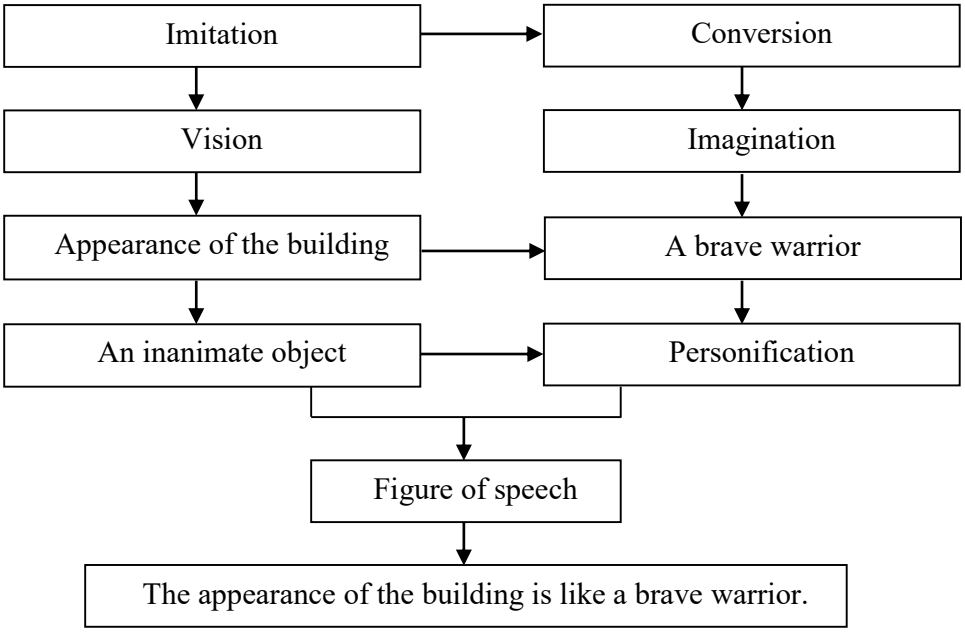

Figure 1 3 rhetorical skills were applied to creative writing

Method

This study adopted the content analysis method and the concept analysis method, which are both qualitative research methods. The indicators used in this study are the first 34 indicators from the book "Advertisement Rhetoric" (Chiu, 2013). The content to be studied is the content regarding Shanghai World Expo Exhibition & Convention Center of the 88th issue of "Az Travel (Lin, 2010)". The analysis method and steps are: (1) read the content; (2) select the parts of the content with rhetorical concepts; (3) confirm the complete rhetorical concepts in these parts of the content; (4) exclude the text not used for the rhetorical skills; (5) extract complete rhetorical sentences; (6) analyze the rhetorical skills used in the extracted sentences, exclude the sentences with only one rhetorical skill applied and for the sentences with two or more rhetorical skills applied, record the names of the skills; (7) analyze the combinations of multiple rhetorical skills; and (8) compare the selected sentences and pick only one representative sentence if there are several sentences that share similar properties. In other words, each of the selected sentences should be unique in its descriptive properties. That is, all the selected sentences should be mutually exclusive in their properties. This way, it is more likely to discover a greater number of rhetorical skills applied to describe different types of appearances.

Results

This study extracted sentences from the essay "COLORFUL EXPO" from the 88th issue of "Az Travel (Lin, 2010)" with ten rhetorical skills including imitation, exclamation, figure of speech, conversion, antithesis, repetition, parallelism, manifestation, symbol, and climax. At least two of the skills were applied to each of the sentences. A total of 12 sentences were extracted with different descriptive properties. Two or more rhetorical

skills were applied to each of the sentences. 10 combinations were found. Combination A (imitation and figure of speech) was found twice. Combination B (imitation, exclamation, figure of speech, antithesis, manifestation and climax) was found twice. The remaining combinations listed below were found once only: Combination C (imitation, repetition, and parallelism); Combination D (exclamation and symbol); Combination E (imitation, exclamation, figure of speech, antithesis, and symbol); Combination F (figure of speech, imitation, and manifestation); Combination G (antithesis, conversion, manifestation, and climax); Combination H (imitation, conversion, figure of speech, antithesis, and manifestation); Combination I (antithesis and manifestation); and Combination J (parallelism, antithesis, and manifestation). These combinations are summarized in Table 1 and Table 2. The figures also reveal the number of times each rhetorical skill was applied.

Table 1 The 1th to the 6th Extracted Sentences with the Corresponding Rhetorical Skills

Sentence / Rhetorical skill		1	2	3	4	5	6	1~6	1~12 Total	%	Rank
1	Imitation	✓		✓	✓	✓	✓	5	8	19.5%	1
2	Repetition	✓	-	-	-	-	-	1	1	2.4%	7
3	Parallelism	✓	-	-	-	-	-	1	2	4.9%	5
4	Exclamation	-	✓	✓	✓	✓	-	4	4	9.8%	4
5	Conversion	-	-	-	-	-	-	0	5	12.2%	3
6	Figure of speech	-	-	✓	✓	✓	✓	4	7	17.1%	2
7	Antithesis	-	-	✓	✓	✓	-	3	7	17.1%	2
8	Manifestation	-	-	✓	✓	-	-	2	7	17.1%	2
9	Symbol	-	✓	-	-	✓	-	2	2	4.9%	6
10	Climax	-	-	✓	✓	-	-	2	3	7.3%	5
Total of rhetorical skills		3	2	6	5	5	2	23	41	-	-
Combination		C	D	B	B	E	A	-	-	-	-

Table 2 The 7st to the 12th Extracted Sentences with the Corresponding Rhetorical skills

Sentence / Rhetorical skill		7	8	9	10	11	12	7~12	1~12 Total	%	Rank
1	Imitation	✓	✓	-	✓	-	-	3	8	19.5%	1
2	repetition	-	-	-	-	-	-	0	1	2.4%	7
3	parallelism	-	-	-	-	-	✓	1	2	4.9%	5
4	exclamation	-	-	-	-	-	-	0	4	9.8%	4
5	conversion	-	-	✓	✓	-	-	2	5	12.2%	3
6	figure of speech	✓	✓	-	✓	-	-	3	7	17.1%	2
7	antithesis	-	-	✓	✓	✓	✓	4	7	17.1%	2
8	manifestation	-	✓	✓	✓	✓	✓	5	7	17.1%	2
9	symbol	-	-	-	-	-	-	0	2	4.9%	6
10	climax	-	-	✓	-	-	-	1	3	7.3%	5
Total of rhetorical skills		2	3	4	5	2	3	18	41	-	-
Combination		A	F	G	H	I	J	-	-	-	-

Discussion

This study applied rhetorical skills to prove the value of combining rhetorical skills using " Combination B" to create a sentence: "The building was a wonderful site in the morning, as if a modern girl full of vigor, dressed in colorful clothes. At night it was like an amiable grandmother dressed in traditional clothes seated in her medieval castle. " the six rhetorical skills in this sentence and their application is analyzed in Figure 2. Imitation

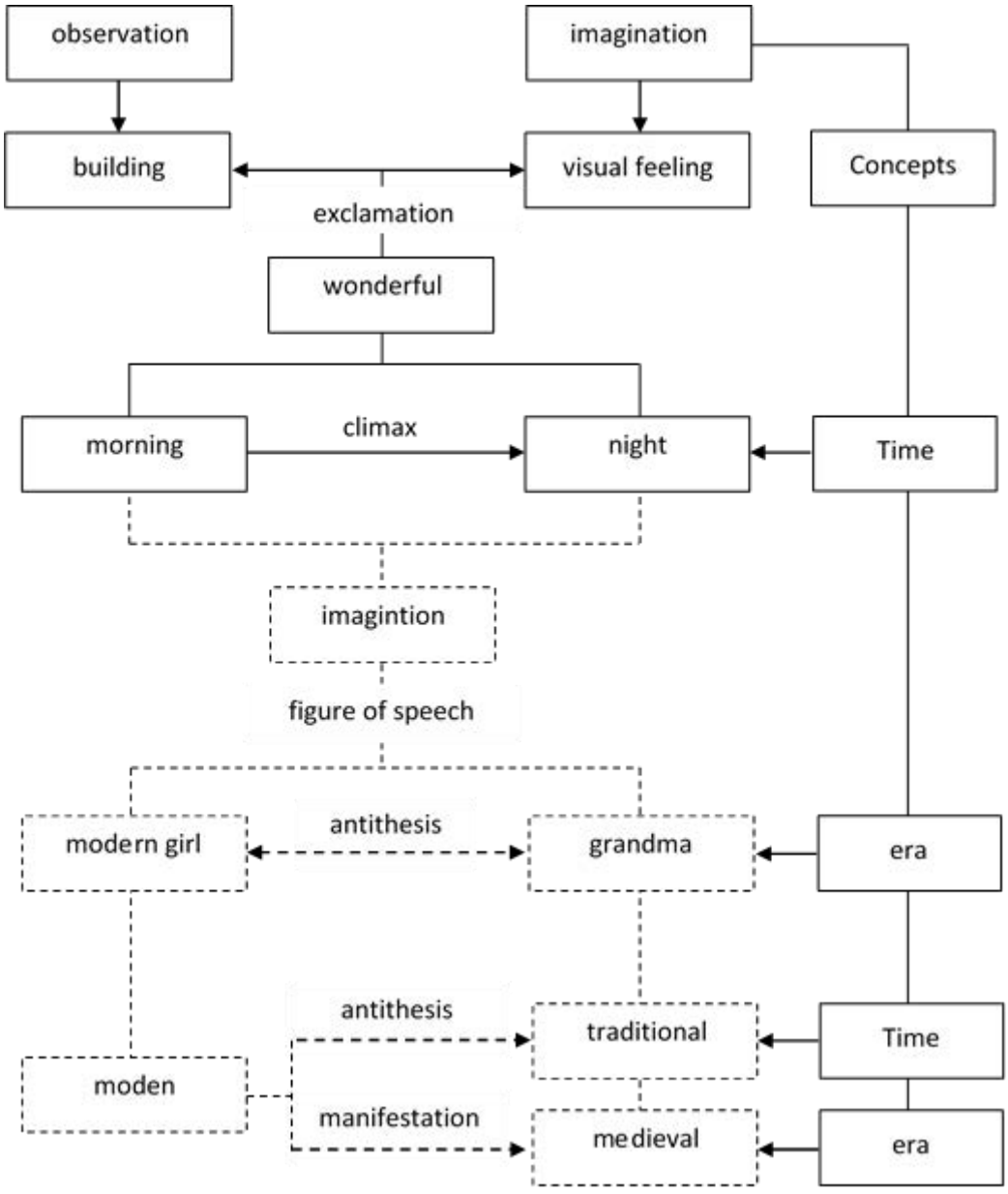

Figure 2. The application of result Combination B's rhetorical skills

The rhetorical skills applied to sentences that appear in reports that describe exhibition centers are based on observation and reflection. Sentence 1 described the quality and shape of the glass and the six colors used in the space through visual observations. The structure includes imitation and parallelism. The character "se (color)" appears 6 times in the sentence. The skill applied here is repetition. Sentence 2 described the center as a "paradise". This skill is a figure of speech and the term "breathtaking" applies the rhetorical skill of exclamation.

Sentence 3 showed the evolution from the past to the present and to the future using booths. Applied rhetorical skills include climax, parallelism, and antithesis. The skill of figure of speech was also applied to enhance the feelings from the situation. Lastly, the skill of exclamation was applied to bring the vigor of the description to the maximum. Sentence 4 described colors and materials through sensual observations. The skill of figure of speech was applied when the shape was described as like "an umbrella/parasol", making the description livelier.

Sentence 5 associated the appearance of the architecture with an UFO based on the author's observation. This is the metaphor structure of the skill of figure of speech. Then, the skill of antithesis was applied to the description of day and night. And the syntax of simile was integrated to create the "mega-metaphor" structure with 1 tenor, 2 connectives, and 2 vehicles. And the skill of exclamation was applied to the praise "first-class".

Sentence 6, Sentence 7, and Sentence 8 all combined the skill of visual imitation and the skill of simile. The descriptions based on visual observations include descriptions of thickness, imagination, color, light or shade, dynamics, being new or old, material, being inside or outside, day or night, delicacy, and perception. The conversion used in Sentence 9 is to convert abstract concepts of "classics" and "future". The rhetorical skill materialized the abstract concepts.

Sentence 10 described the association when seeing a post office from the Ching Dynasty. The "Ching Dynasty" is a period in the history. "Sending to oneself" is in the present day. There is a comparison of time between them and this is where the skill of antithesis was applied. Sentence 11 compared the old-fashioned and new architectures. The skills of manifestation and antithesis were applied regarding the time change from ancient to modern times. Sentence 12 described the design style using the terms "concise" and "steady", this is where the skill of antithesis was applied. And the skill of manifestation was applied with the term "nostalgia" to present history as present.

Conclusion

After this study analyzed the sentences with two or more rhetorical skills, it was found that the most frequently applied rhetorical skill was visual imitation, followed by the skill of figure of speech, which helps readers to understand what the author wanted to express more easily through analogy. This is why this skill was the second most frequently used skill. These two skills could be combined with other rhetorical skills easily.

Moreover, whether being used separately or in combination with other rhetorical skill(s), the skills of imitation and figure of speech were the most frequently used rhetorical skills. The researcher believes that, when writing a report regarding an exhibition center, if the purpose is to related meaning in a lively way, using imagination with analogy to describe the center vividly will definitely grab visitors' attention.

The second important combination consisted of these two rhetorical skills combined with the skill of antithesis featuring contrast descriptions and the skill of exclamation to express surprise or praise, that is, the combination of 4 rhetorical skills: imitation, figure of speech, antithesis, and exclamation. In sum, if the 10 rhetorical skills presented in this study can be mastered and applied flexibly, it will definitely be possible to make reports even more brilliant.

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Truth without Action: The Myth of Higher-Education Accountability

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This reflection utilizes Kevin Casey's 2007 article, Truth without Action, as a springboard to address contemporary issues related to autonomy, accountability and accreditation in higher-education. With escalating costs, rising unemployment and deepening consumer debt, it is natural for government officials to seek out a cause, or more accurately, a scape-goat for the evolving crisis. Over the last few decades, starting with A Time for Results in 1980, following with The State Post-secondary Review Entities (SPREs) in 1992; and continuing with the Spellings Commission on the Future of Higher Education Report in 2006, federal agents have politicized American education and issued indictments against higher-education. Tuition costs are too high, graduation rates are too low and student learning-outcomes remain ineffable. With the recent re-election of President Obama, "the Education Department will continue to play an active role in regulating and attempting to influence colleges and universities." (Nelson, 2012) Amy Laitinen, deputy director for higher-education at the New America Foundation and former Education Department policy advisor, recently stated, "The President himself, not just his advisors, is very interested in the college cost and the college outcome issue." (Nelson, 2012)

During his first term, the Obama administration overhauled the student loan system, increased Pell Grants and created a "highly controversial" framework for regulating for-profit colleges. (Nelson, 2012) Despite the hoopla surrounding those regulations, and the fierce pushback they inspired from for-profit colleges, higher education was still a sideshow at the Education Department during the President's first term. … But higher education is poised to play a big role in the second term, in part because Obama has put forward an ambitious proposal to reshape parts of the federal financial aid program and use the money to encourage colleges to hold down tuition price increases. (Nelson, 2012)

In her article, *Examining Who Could Shape Higher Education Policy in Obama's Second Term* (2012), Libby Nelson credits the Spellings Commission, created under the Bush Administration, with shining a spotlight on post-secondary issues. Highly inflammatory, the Spellings Report (2006) presented a scathing attack on the accountability of here-to-for autonomous educational institutions. Kevin Carey's 2007 article, *Truth without Action*, serves to meticulously outline that critical confrontation and can be viewed as "a warning shot fired over the bow." Reading like a chapter out of Sun Tzu's *Art of War* (480 B.C.) or Adolf Hitler's *Mien Kampf* (1925), Carey's article presents his ideology, simultaneously warning the defendants and arming the prosecutors.

Carey begins his article (2007) quoting British statesman Benjamin Disraeli (1804-1881). Justice is defined as "truth in action." He feels Disraeli's aphorism holds two key elements of effective accountability: truth and action. Accountability begins with a conception of purpose. Evaluators look for "real things, events or facts" to "indicate the degree to which the institution has fulfilled its purpose." (p. 24) Carey proposes that educational institutions cannot merely be repositories of knowledge, but must also facilitate a means of action, serving as an agent of progressive change. While successful at gathering information, many academics in higher-education "studiously ignore the need for action." (p. 26)

As a research and policy manager, with a background as a state budget director for education, Kevin Casey openly sides with the criticisms cited in the Spellings Report, and keenly advances state and federal oversights related to academic accountability. Accountability is based on the view that people work best when their motivations are both internal and external. Colleges give students grades because they know that while students may have an innate desire to learn, they learn more if their performance is motivated and judged.

Humans are fallible; they work harder and better if they know someone else is paying attention to how well they do. The same is true for institutions. (Carey, 2007, p. 26)

Based on this attitude, Carey (2007) places little merit on institutional self-study, peer review or self-accountability. Railing against the myth of self-accountability, he expresses skepticism, if not almost distain, for true institutional independence, program diversity and academic freedom. He states, "Colleges and universities seem to cling to the fundamentally illogical idea that a college or university can be accountable only to itself and its peers." He continues to ridicule the concept and established tradition of institutional autonomy and internal evaluations. When reciting the attitude he feels many institutions express, Carey states, "The idea can be summed up simply: leave us alone. And if we must be judged, we will judge one another. We will determine the truth and take action as we please." (p. 26)

Having possibly over-stepped his bounds, while still unapologetically making his point, Carey (2007) back-tracks a bit in the next few paragraphs. He carefully supports the right of colleges and universities to "define their own mission and govern themselves," but then states that, "independence and immunity from accountability are not the same thing." (p. 26) "Self-governance means freedom to choose *how* to succeed—not freedom to choose *whether* to succeed." (p. 26)

While no one would argue the need for colleges and universities to be responsible, successful, and even relevant; many would actively debate who should wield the power to evaluate, punish or execute reform. A pivotal question never asked in this article is: Does any government agency have the right to evaluate, and thereby regulate, an independent academic institution, its faculty or the works they produce? The privilege of scholastic autonomy is a time honored right of educational enclaves first established by medieval monasteries and transferred later to Renaissance universities. Today, those same principles form the corner-stone of academic freedom and intellectual property.

As early as 910 A.D., the French Abbey of Cluny had a written constitution that provided it with freedom from lay supervision and (after 1016) from the jurisdiction of the local bishop. As an independent entity, "Cluny became the fountainhead of the most far-reaching religious reform movement in the middle ages," with nearly 1000 houses (ancillary monasteries) located in different countries. (Cluniac order, 2011)

In their paper, *The Intellectual and Institutional Properties of Learning: Historical Reflections on Patronage, Autonomy and Transaction* (2012), John Willinsky and Johanne Provencal propose that through a sustained model of institutional endowment, medieval monasteries were able to provide those interested in learning with a safe, stable and productive environment. As this form of patronage did not depend on the reputation or productivity of the learned as was the case with personal patronage, the monks and nuns with such interests could pursue their self-directed studies comfortable within the monastic spirit of humility and selflessness, without having to compete for the attention of patrons. Combined with the papal privileges and the canonical exemptions granted to monastic orders to ensure their other-worldly autonomy, the cloisters provided a quiet, seldom disturbed place in which to pray and pursue one's studies. (p.4)

In this way, the support of learning and the learned evolved into an 'act of trust and faith," on the part of the lay community. (Willinsky & Provencal, 2012, p. 2) Learning came to operate removed from the secular world, existing in its own sovereign construct. Scholarly undertakings existed within their own unique economic sphere, distinct and separate from apprenticeship, labor and other forms of capitol exchange. Based on these foundations, higher education may well be within its rights to shun the current slanderous assaults of politically driven interlopers and reformers.

But that does not mean that monasteries were exempt from criticism and did not periodically fall prey to zealous attacks. While intellectual sanctuary was guaranteed within the network of monasteries, true autonomy was still relative. Intellectual doing was often celebrated within the confines of the enclave, yet revolutionary propositions could easily lead to external condemnation. "The threat of having ones work accused of heresy was always present," and if rendered true through a court of law could often lead to death. (Willinsky & Provencal, 2012, p. 5)

In the 1860's, King Mongkut (1804 – 1868) of Siam diverted the colonization of his kingdom by outwitting European missionaries, politicians and merchants. Europeans rationalized that the colonization of foreign people was righteous since they were heathens. Domination and subjugation of the natives was necessary to convert them to Christianity and grant them the possibility of salvation. After keenly observing European expansion in action throughout South-east Asia, the king pre-empted the missionaries' basis for occupation. "His awareness of the threat from the British and French imperial powers, led him to institute many innovative activities." (Winichakul, 1997, P 57) Jesuit monks had been present in Siam since 1687. Continuing this tradition, the king renewed privileges, which granted to the Catholic missionaries the right to preach the gospel throughout Siam. Additionally, he hired a British Governess to educate his children in proper European etiquette and protocol. When the missionaries arrived and observed the status of the king and his court, they were obligated to report that they were not barbarians, but were in fact already civilized. (Winichakul, 1997) With no morally valid right to occupy the kingdom, Siam remained an autonomous state throughout the 19th century.

If higher-education is willing to adopt the lesson learned from this historical event, there is a way to derail the impending oversight of federal agents. Educational institutions must actively endeavor to secure and promote scrupulous self-accountability. The power to access, critique and reform must remain within the confines of the academy. Alverno College is a good example of a small liberal arts college that has successfully addressed student-learning outcomes, and achieving a stellar reputation nationally, thereby staying off external impositions.

Central to Carey's critique (2007) is the failure of, or more precisely the lack of, real accountability through institutional or curricular accreditation. He acknowledges that most institutions currently meet state and federal accreditation standards. The problem with this situation is that the existing standards often conceal "the most important accreditation related information about institutional quality," thereby misleading the general public. (p. 26) "Little data is gathered about the quality of teaching or the level of student learning." (p. 27) Carey is primarily interested in the documentation of student skills related to areas like critical thinking, analytic reasoning and communication.

The realization that some measures of accountability may be only marginal or remedial is not a revelation to the academy, which regularly attempts to revise the measures used in self and peer evaluation. With the recent attempts by state lawmakers to tie public funding of higher education to colleges' performance, there has been a heightened concern for accountability. In an article, *Better Measures of College Performance* (2012), Paul Fain debates the issues concerning valid performance assessment criteria and tools, concluding that the "measuring sticks that reflect the difference between institutions and who they serve are hard to find." (p. 1) Graduation rates are often used by policymakers as a measure of success, but they fail to address detailed information related to incoming students and their prior academic preparation and personal risk factors. Addressing this enormously complex combination of variables, strategists associated with the Bill and Melinda Gates Foundation have put forth a number of research papers dubbed the "Context for Success." The seven papers center on three primary outcome measures: "Student progression and completion, labor market results and the direct assessment of student learning." The researchers said, "Nuanced ways of measuring college performance are important as policy interest in higher education grows, thanks to deep concerns about student debt and workforce development." (p. 1) Without "good" data, comparisons can be misleading and do as much harm as good through bad policy decisions, misguided student choices and counterproductive incentives.

Softening his approach, Carey continues, "Accountability is really just responsibility—to the students whom colleges educate, to the governments who provide funding, to society at large. Responsibility creates obligation and limits freedom, but at its best it also creates mutual, cooperative relationships." (p. 29) although this statement appears to be the offering of an olive branch, he openly brandishes a stick in his other hand. To give bite to his bark, Carey reminds college and university administrators that since the federal government ties accreditation to student aid, an institutions inability to meet stricter or more far-reaching accreditation

requirements could lead to a "financial death penalty." Posing and an ally or concerned friend, Carey concludes his article (2007) by warning higher-education of the possibility of federal impositions or market marginalization, if more transparent and rigorous accountability is not soon exercised.

In conclusion, accountability itself is not in question here. Scholastic enterprises will always be reviewed and tangible results expected. There will always be a need for sincere academic accountability. As such, the need for responsible administration is also not in question, as faculty, deans and provosts are acutely aware of curricular inconsistencies. The key question is: who has the right to police the curriculum activities and learning outcomes within the confines of a public or private institution, department or classroom? And finally, how much influence should specific benefactors, even governments, be allowed to exercise within the confines of the greater academic enclave?

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Using R in Water Resources Education

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Abstract

This review paper will deal with the possibilities of applying the R programming language in water resources and hydrologic applications in education and research. The objective of this paper is to present some features and packages that make R a powerful environment for analysing data from the hydrology and water resources management fields, hydrological modelling, the post processing of the results of such modelling, and other task. R is maintained by statistical programmers with the support of an increasing community of users from many different backgrounds, including hydrologists, which allows access to both well established and experimental techniques in various areas.

1. Introduction

This chapter reviews the possibilities of applying the R programming language in hydroinformatics, e.g., in applications related to water resources and hydrology. R is an open-source software for statistical computing, which means that R is freely available, so its users are free to see how it is written and improve or extend its possibilities. The last characteristic is particularly important from the point of view of this review, because the possibility of its extension is widely used by R users from many different backgrounds. Consequently, this leads to one of the best things about R, which is the large amount of existing add-ins (so-called "packages"), which are aimed at solving various tasks in different fields, including hydrology, water resources, climatology, soil science and meteorology. These packages can be optionally loaded into the basic R environment, which permits access to both well-established and experimental computational methods from different fields.
Although R was originally built for statistical tasks, its programming possibilities are not limited to them; it is a full-featured object-oriented programming language and is suitable for a very broad class of tasks, including various tasks from the domain of hydrology and related fields. As hydrology is a very data-intensive domain, it is natural that R could be applied in various statistical or data-mining tasks related to hydrological and water resources data. Hydrological data are often time series or have a spatial character; such data types also have a reliable support in R. Furthermore, R is a high-level language in which one can implement new methods from the area of physical modelling. R has various commands to operate on matrices and for computing integrals, and it has tools for solving differential equations. Although such modelling is not a typical application of R, based on these features, R is suitable even for building mathematical and hydrological models in which solving differential equations is eventually included.
R is rooted in S, a statistical computing and data visualization language, which originated at Bell Laboratories [1]. In 1993, Robert Gentleman and Ross Ihaka developed an implementation of S, which they called "R". They made it open source in 1995. The R language provides a rich environment for working with data, especially data to be used for statistical modeling or graphics. R offers a wide variety of statistical and graphing techniques (e.g., linear and nonlinear modeling, classical statistical tests, time-series analysis, classification, clustering, etc.), and as has already been noted, is highly extensible (there are about 25 packages supplied with the basic R distribution, and many more are optionally available through the CRAN family of Internet sites).
The R language includes [2]:

- an effective data handling and storage facility,
- a suite of operators for calculations on arrays,
- a large, coherent and integrated collection of functions and tools for data analysis and for general programming tasks,
- graphic capabilities for data analysis and display either on-screen or on hard copies, and
- Simple and effective programming language features, which include conditional statements, loops, possibilities for the definition of user-defined functions, input and output facilities, etc.

The starting point for getting information about R is the Comprehensive R Archive Network (CRAN) project, where it is possible to download R and other related resources and obtain help. For instance, a sample introductory session tutorial is available, along with various manuals edited by the R Development Core Team, as well as contributed manuals, the R Journal and so-called task views, which are summarizations of R and contributed R package possibilities for various specialized tasks, which are usually edited by an expert in that field (e.g., for clustering, time series, machine learning, Bayesian inferences, probability distributions, optimization, analyses of spatial data, etc.). Another basic information point is the R-project (www.r-project.org) with links to, e.g., an R-wiki, FAQs, conferences, user groups and mailing groups (hydrology-related questions could be sent to **R-sig-ecology**, which is a special interest group for ecology).
R has inbuilt help assistance. To get more information on any specific function, for example, *optimise*, the command is:
> *help(optimise) or ?optimise*

Assistance is available in an HTML format by running:
> *help.start()*

Which will launch a Web browser that allows the help pages to be browsed with the assistance of hyperlinks. The *sos* package [3] provides a means to quickly search the help pages of the contributed packages, which is particularly important if the user is trying to discover if some tools in the R community exist for a particular problem. Its *findFn* function, to which some alphabetic search string can serve as input, returns matches with this string which were found in all the help pages; they can be sorted and subsetted by user specifications and viewed in an HTML table. E.g., by typing the following command to the R console, we get 191 results:
> *findFn("Regional Frequency Analysis")*

"Rseek" is a specialized R search engine (www.rseek.org), and "quick-R" is a handy web page for basic information about R language (www.statmethods.net/index.html). Many other similar resources exist.

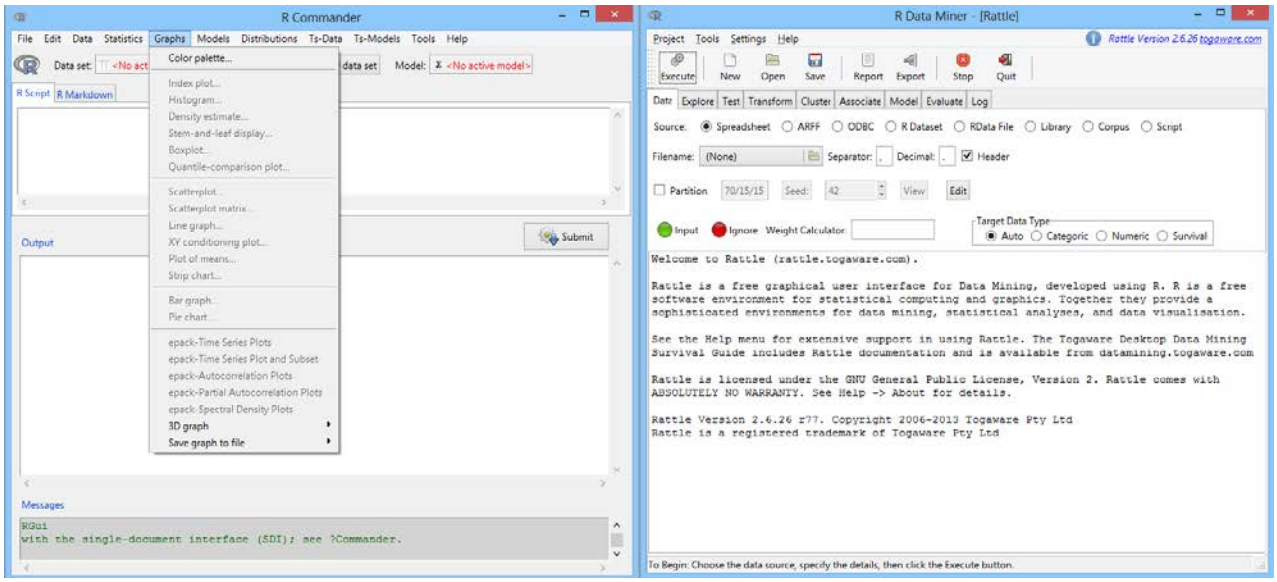

Figure 1. Two GUIs for R: R-Commander on the left and Rattle on the right side.

The R user interface is an interpreted programming environment with a command line interface (CLI). This means that when one enter a statement or a group of statements to an R console and hits the Enter key, R computes and eventually responds with a text or graphic output (in a separate window) as a reaction to this action. Although this seems very simple and may be unsophisticated from some points of view, the CLI interface is preferred by power users, because it allows for the direct control of calculations and is more flexible than menu/icon-driven graphic user interfaces (GUIs). It has advantages from the point of view of reproducible research, e.g., for verifying, controlling and consulting on the work accomplished, as well as running an analysis with different data. However, a good knowledge of the language is required. A CLI can therefore be a disincentive for beginners. The learning curve is typically longer than with a GUI application.

For this reason several projects have developed alternative user interfaces. Approximately 20 such projects exist; the most well-known are *R-commander*, *Rattle* and *RStudio*. The *R-Commander* and *Rattle GUIs* consist of a window containing several menus, tabs, buttons, and information fields (Figure 1). RStudio is very popular in the R community; it integrates all of the tools one uses while working and programming in R into a single environment (Figure 2). It can be run on a desktop (Windows, Mac, or Linux) or even over the web using *RStudio Server*. *RStudio* includes a variety of powerful coding tools designed to enhance productivity (code completion, searchable history, debugging tools, etc.); it enables quick navigation for inputing files, functions, help pages, etc. It is the most popular compromise solution between the mouse-clicking GUI and the command line programming environment in the R community.

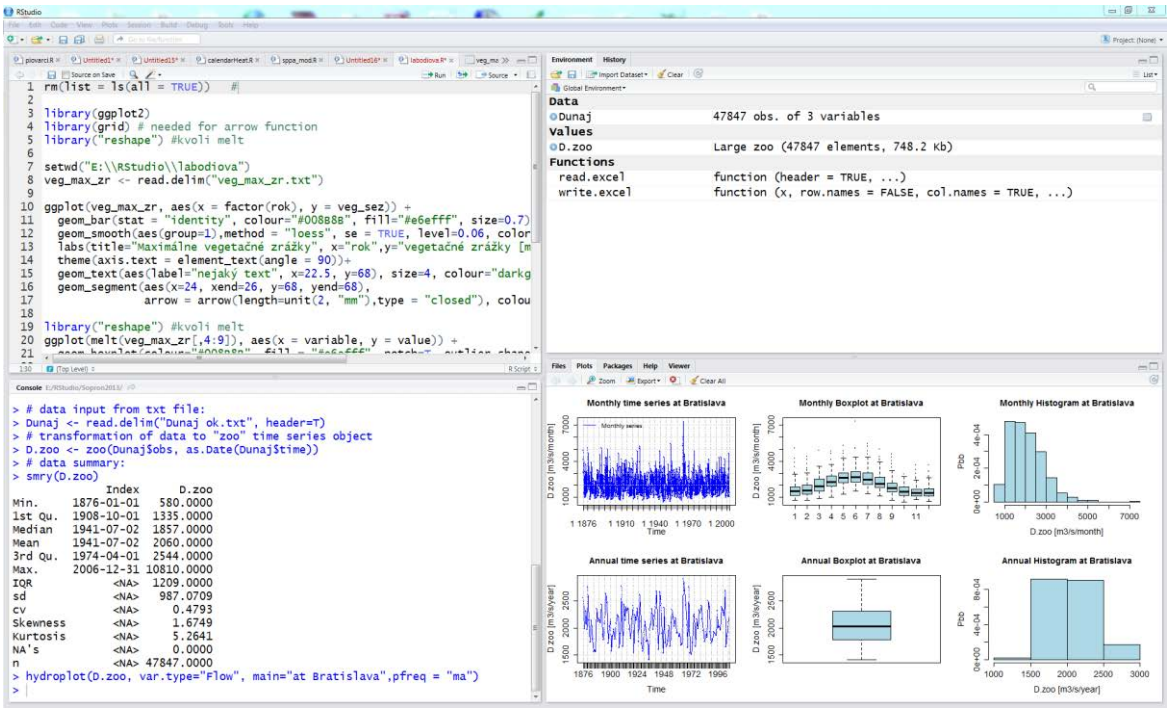

Figure 2. RStudio IDE: a powerful and productive user interface for R.

Most classical statistics and much of the latest methodology are available for use with R, and quite a lot of tools are also available for hydrology and related subjects in R. Nonetheless, users may need to do a little work to find them, so the authors of the present paper decided to offer this review, which collects information about some water resources and hydrology-related methods and tools available in R.

2. Applications of R in Hydrology and Related Subjects

The following text contains a selection of possible applications of R in various hydrology and water resources management tasks. For some tasks code snippets are provided, even though it is not possible to offer complete tutorials for the tasks presented while keeping this work to a reasonable length. A brief introduction to R is quite a good prerequisite for understanding the mentioned code snippets, or some intuition of "what could be what" in the programming language (based on familiarity with some other programming language) could be useful. Anyway, this is not necessary if the reader does not need to understand coding, but only seeks an overview of the features available in R, which are useful in hydrology.

2.1. Data Pre-processing

Hydrological modelers spend a large amount of time on various data pre-processing and post-processing tasks. R is logically a powerful environment for such tasks, because it is generally oriented towards management of data and their statistical analysis. Because of the possibility of using basic R literature for this subject, we will not go into much detail here, and only "water specific" tools in the R description follow.

The *waterData* package [4] allows users to import the U.S. Geological Survey (USGS) daily hydrological time series data into R; it cleans, plots and summarizes the imported data and calculates and plots eventual streamflow anomalies. Although the *waterData* package provides this functionality only for the USA, this feature could be useful while testing some methodologies and when one needs some data for such testing. The remaining features of this package are more generally aplicable. E.g., the *fillMiss* function from this package estimates missing values in a time series of hydrological observations. The *fillMiss* function checks the percentage of missing values and the size of the largest missing block of the data. If there are very large periods

with missing values, the data may not be appropriate for analysis. If less than a user-specified percentage of the data is missing and the largest block is less than a user-specified number of days, the data will be filled in by using the structural time series model *StructTS* from the base stats package in R. The fitted structural time series is then smoothed via a state-space model, *tsSmooth*, from the base package for statistics in R - stats.
With regard to missing data in general, many modelling functions in R offer options for dealing with missing values, e.g., for some R functions data should not necessarily have to be complete. Besides this, good missing data functionality can be accessed through various other (non-hydrological) R packages, e.g., *Amelia* II [5-8], which offer general missing data functions that are also suitable for hydrological data sets.
Another interesting package, which contains functions to support the processing and exploration of data, is *wq*, which was originally developed for monitoring aquatic ecosystems. The name of the *wq* [9] package stands for "water quality" and reflects a focus on time series data describing the physical and chemical properties of water, as well as plankton. However, many of the functions should be useful for a time series analysis regardless of the subject matter. E.g., the function *mannKen* does a Mann-Kendall test of trends in a time series (it includes a seasonal alteration of this function); the *decompTs* accomplishes multiplicative and additive decomposition of time series), etc.
A very interesting R package is *hydroTSM* [10], which provides functions for the management, analysis, interpolation and plotting of time series used in hydrology and related environmental sciences. Various conversion functions are available for obtaining, e.g., monthly, annual or seasonal time series from daily data. The *smry* function serves for summarizing data; the *fdcu* function computes and plots the flow duration curve (FDC) for stream flows as well as for two uncertainty bounds, with the possibility of plotting an additional FDC representing, e.g., simulated stream flows, in order to compare both curves. Automatic interpolation for a hydrological time series with an optional plot could be accomplished by the *hydrokrige* function from this package. According to the author's comment, it was originally developed as a way to more easily accomplish the computation of average precipitation over subcatchments (given as an input in a shapefile map), based on the values measured at several gauging stations, but it can also be used for interpolating any variable over a grid given by a raster map [11]. Available algorithms for this task include the inverse distance weighting, ordinary kriging, and kriging with an external drift. Some functions from this package are applied in an example given in the following subchapter about statistical analysis.
Various tasks for data preparation in water resources include general tasks in statistics and data mining, for which many functions are available in R, e.g., the functions for data transformation, data normalisation, the imputation of missing data, data reductions (variable selections for a given task from an available dataset) or outlier detection. We will not describe the availability of tools for these tasks in R here; those readers interested in this important subject can easily find the extensive literature on these topics anywhere (e.g., in the R related book series UseR! from Springer).

2.2. Statistical Analysis of Hydrological Data

One of the main tasks of hydrological practitioners and scientists is the gathering of information regarding the presence and availability of water in all its forms on earth. For this reason the collection and evaluation of hydrological data is particularly important, and various tasks regarding these arise: quality control, the estimation of errors, correction techniques, and statistical and data mining analyses. These are the main use areas of the R application, so the possibilities of R being applied for evaluating hydrologic data and for handling various statistical analysis tasks are very broad. For example, R's available tools include functions for descriptive statistics, including the very interesting graphing possibilities of R, tools for the evaluation of a dataset's central tendencies (mean, median, mode, etc.), measurements of a spread such as the variance or standard deviation, and tools for univariate frequency distributions, bivariate distributions or copulas. The same is true for inferential statistics, testing hypotheses, trend analyses, multivariate statistics, etc.

Because of the logical availability of such statistical possibilities in R, we decided to focus this part of the chapter on only one selected topic or brief "illustration" from statistical hydrology: the extreme value theory. In the example presented, daily flow data from the Bratislava flow-measuring station (on the Danube River) are used from the period 1876 - 2006. The data were available in a txt format separated by a tabulator. If the reader wishes to experiment with his own data and currently does not have enough knowledge of R, it is better to prepare them in a similar way as the data file which was used in our example (Danube.txt):

ID Time Obs
1 1876-1-1 1768
2 1876-1-2 1765
3 1876-1-3 1722
etc.

Obs are observed flows in $m^3.s^{-1}$. The basic settings of the project, the data input from the text file, and some numerical and graphic data summarizations are executed using the following code:

```
# setting of the working directory (for input and output data)
# and loading necessary R packages:
setwd("C:\\RStudio\\Danube")
library("Kendall")
library("hydroTSM")
# retrieving data from txt file:
Danube <- read.delim("Danube.txt", header=T)
# transformation of data to "zoo", e.g., time series object
Danube.zoo <- zoo(Danube$obs, as.Date(Danube$time))
# data summary:
smry(Danube.zoo)
hydroplot(Danube.zoo, var.type="Flow", main="at Bratislava",
      pfreq = "ma")
hydroplot(Danube.zoo, pfreq="seasonal", FUN=mean)
fdc(daily2monthly(Danube.zoo, FUN=mean))
MannKendall(Danube.zoo)
```

The next two lines of the previous code after the *smry* function serve for the application of the *hydroplot* function from the *hydroTSM* package for producing the graphs in Figure 3 and 4, which serve for a description of the data. The *fdc* function from the same package produces a flow duration curve. After the application of the *MannKendall* function in the last line of the code, the function's output to the console was the following:

tau = 0.00256 and 2-sided p-value = 0.40179

which means that the null hypothesis concerning no trend cannot be rejected based on this data.

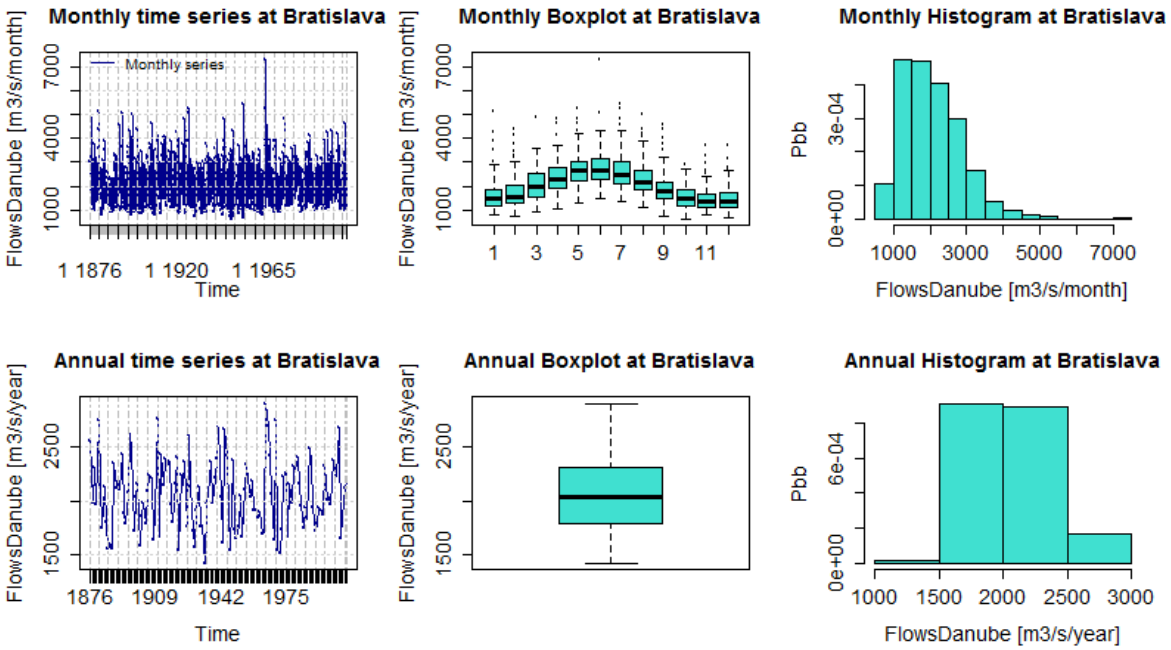

Figure 3. Graphic description of the historical flows on the Danube in Bratislava by the *hydroplot* function.

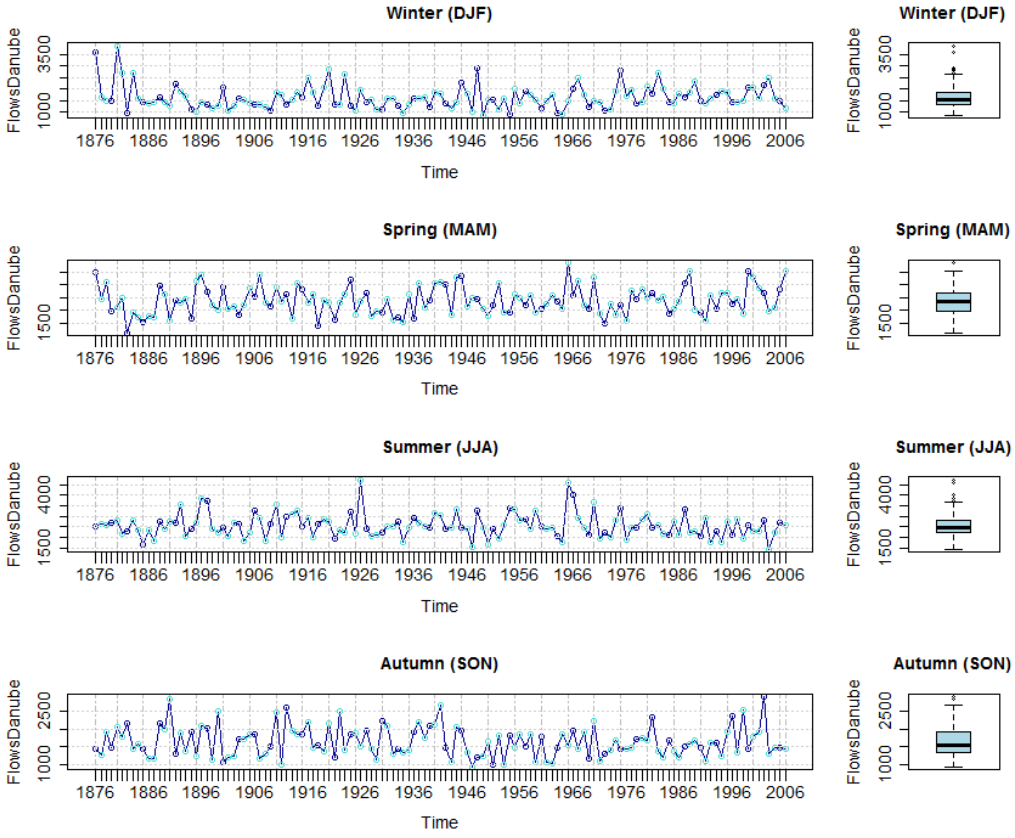

Figure 4. Seasonal graph of the Danube's historical flows by the *hydroplot* function.

In the next code a trend analysis is presented as another example of the exploratory data analysis of the Danube data, in which the *hydroTSM* package and basic R commands are applied. The *hydroTSM* package offers various time scale transformation functions, e.g., the *daily2monthly* function, which is used to transform the daily data to monthly data using some aggregation function (specified by the FUN parameter). Other similar transformation functions are available too. The mean is used in the case of the following code, but if it is desirable, it is possible to use, e.g., the max function for the extraction of a month's maximal values or sum for

a summarization of the daily data (useful e.g., when working with precipitation data). After the application of this function, a trend analysis of the monthly values by graphic means is executed by the code.
The *scatter.smooth* function in this example serves for plotting a scatter graph of the selected month's average flows versus the time (130 years) and adds a smooth curve computed by the Loess method to this plot. It is applied twice (for August and for December), and it can be seen from Figure 5 that for August, around the midpoint of the period analyzed, the trend line declines as opposed to December, where the trend is rising. The parameter from (equal to 8 and 12) in the *seq* function, which is nested in the *scatter.smooth* function, stands for the identification of the two months analyzed (August and December). The flow data values of these months are selected from this starting value (index) by step 12 (parameter by) from all 1572 months of the available period of the data (1876-2006).

```
Danube.month <- daily2monthly(Danube.zoo, FUN=mean)
# parameter for specification of more graphs in
# one plot – one column with two rows:
par(mfrow=c(2,1))
scatter.smooth(x=c(1876 : 2006),
        y=Danube.month[seq(from=8,
                to = 1572, by=12)]
        col="darkblue", xlab="year",
        ylab="August average flow m3/s")
scatter.smooth(x=c(1876 : 2006),
        y=Danube.month[seq(from=12,
                to = 1572, by=12)],
        col="darkblue", xlab="year",
        ylab="December average flow m3/s")
```

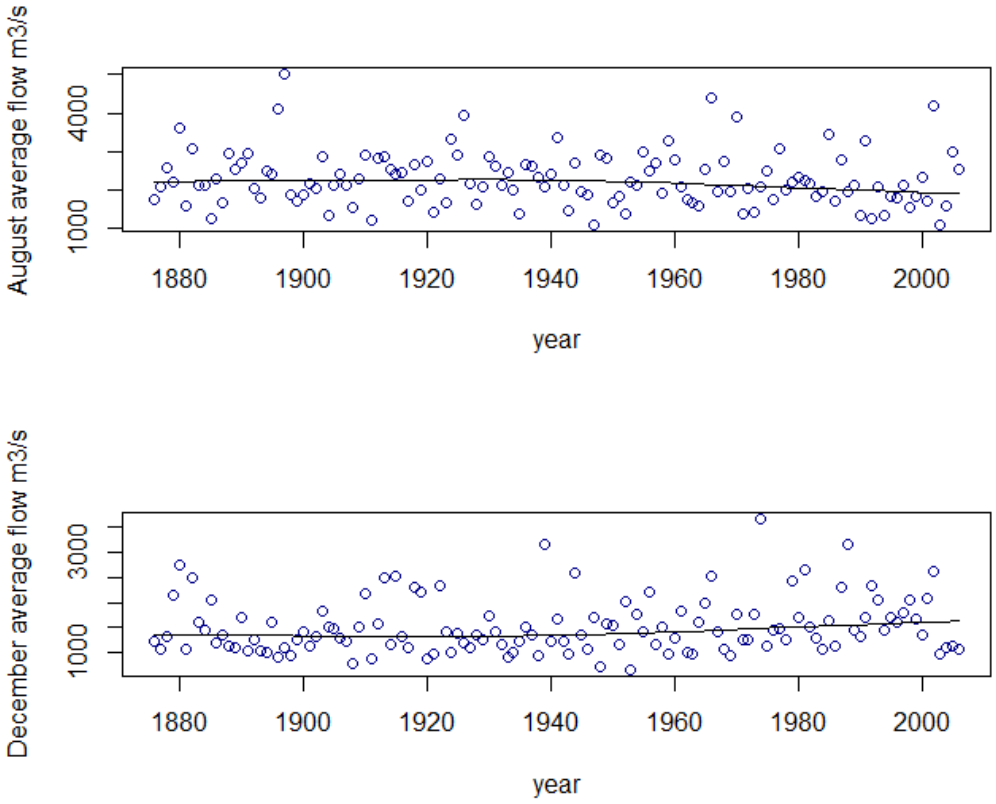

Figure 5. Scatter plot with a smooth curve fitted by the Loess method for August and December (helpful for a trend analysis)

With the next code, an extreme value analysis is presented by utilizing the possibilities of R in this branch of statistics. It is necessary to load two packages – *fitdistrplus* [12], which contains several functions to help with the fit of a parametric distribution. In addition to the maximum likelihood estimation method, the package provides the moment matching, quantile matching and maximum goodness-of-fit estimation methods. In addition, the *evd* package is used; it extends the simulation, distribution, quantile and density functions already available in the basic distribution of R to various extreme value distributions.

```
library("fitdistrplus")
library("evd")
# Extraction of the maximal flows for all years
Danube.max <- daily2annual(Danube.zoo, FUN=max)
# Fitting of the generalized extreme value distribution (starting
# values of the location and scale parameters are set
# on the basis of trial and error.
# Actuall values of these parameters were searched for
# with following function by estimating the maximum likelihood):
fgev <- fitdist(as.vector(Danube.max), "gev",
start = list(loc = 5000, scale = 2000))
# Computation of 100-year and 1000-year flows in Bratislava by the
# quantile function of generalized extreme value distribution:
qgev(c(0.99,0.999), fgev$estimate[1],fgev$estimate[2])
# Plotting of the fitted distribution:
plot(fgu, col="turquoise")
```

The results of the *qgev* functions for the Danube data were Q_{100}=10 824 $m^3.s^{-1}$ and Q_{1000}=13 784 $m^3.s^{-1}$. The graph plotted by the last command with a visual evaluation of the fitting procedure is in Figure 6.

Other possibilities are also available in R for extreme value analysis. Sometimes, using only a maximum block value as in the previous example (e.g., maximal flow in year) can be wasteful as it ignores much of the data [13]. It is often more useful to look at exceedances over a given threshold instead of simply taking the maximal annual values (which was done when computing the variable *Danube.max*). The *POT* package [14] offers tools to perform statistical analyses called the “peaks over the threshold” method in univariate and bivariate cases. It includes some preprocessing tools for data preparation, e.g., flow (data) selection from the base data to the input data file for the *POT* analysis, which preserves the independence of the data; numerical and graphic tools for the choice of a threshold; the definition of the generalized *pareto* distribution; etc. Although *POT* includes some graphic tools for the selection of a threshold, this task is a difficult topic and still an area of active research. So we did not experiment with this method in this review as a paper more focused on this subject would be more appropriate.

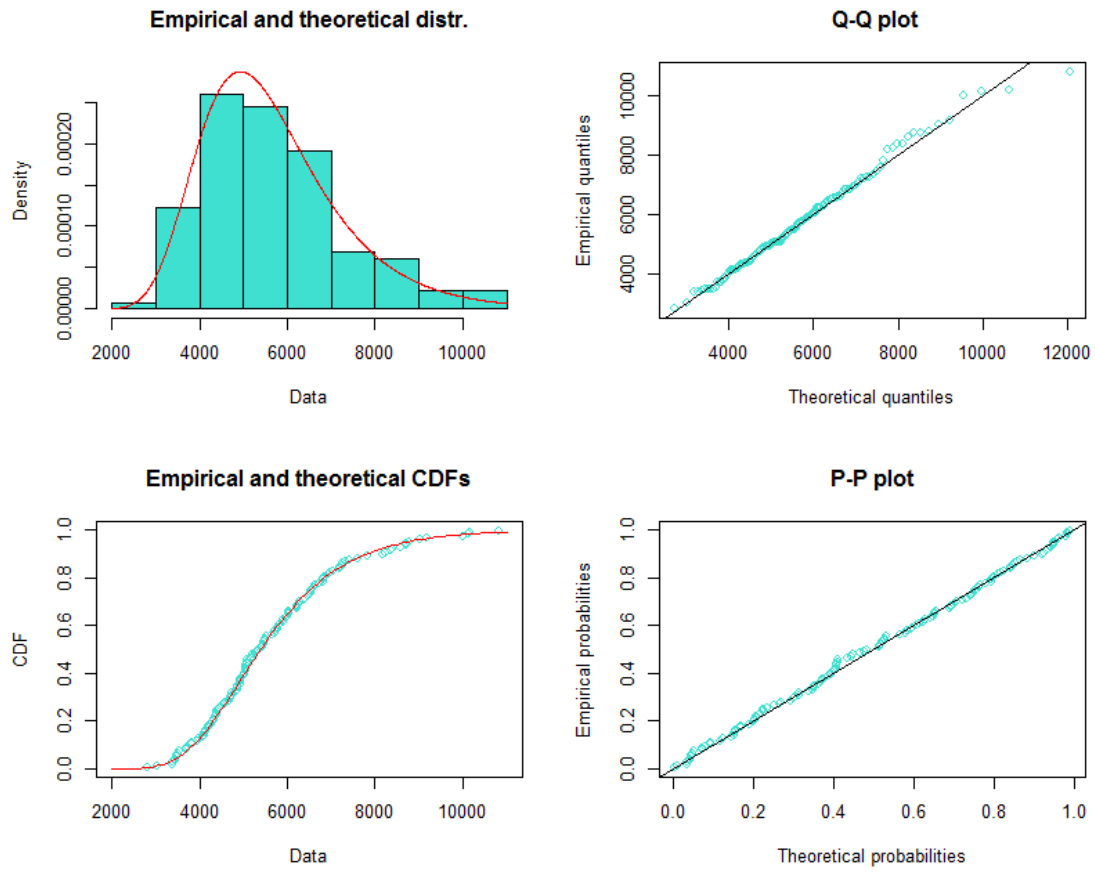

Figure 6. Plot of an object with a fitted generalized extreme distribution for the Danube data.

2.3. Hydrological Modeling and the Evaluating Model

Hydrological models are simplified representations of a hydrological cycle and play an important role in many areas of hydrology, such as flood warnings and management, agriculture studies, dam design, climate change impact studies, etc. Hydrological modeling can be supported quite well by R.

There are several steps in hydrological modeling: preprocessing the data, sensitivity analysis (identification of the responsiveness of the model parameters); calibration, e.g., tuning the model parameters by checking the results of the modeling against observations by utilizing graphs and various goodness-of-fit statistics, the modeling itself by various types of models (data driven, conceptual, physically based), the validation of the model, and evaluating the results and their visualization.

A sensitivity analysis of the models could be supported by the *sensitivity* and *fast* packages. The *sensitivity* R package [15] contains a collection of functions for a global sensitivity analysis of a model's output. *fast* is an implementation of the Fourier Amplitude Sensitivity Test, which is a method used to determine the global sensitivities of a model's parameter changes with relatively few runs of the model (which is useful in the case of, e.g., physically-based models). The R package *FME* is a modeling package designed to confront a mathematical model with data. It includes algorithms for sensitivity and Monte Carlo analysis, parameter identifiability and model fitting; it also provides a Markov-chain based method to estimate parameter confidence intervals.

Regarding the modeling itself, great support is available for data-driven models; some tools are available for conceptual models as well as for physically-based hydrological models. *Physically-based* models solve exact physical equations (differential equations), usually on the basis of spatially distributed inputs. Although it is better to accomplish such a type of modeling, which is usually computationally demanding in compiled languages, there is also some support for this type of modeling in R. The *wasim* package [16] provides tools for

processing the data and the visualization of the results of the WASIM-ETH hydrological model. The grid-based Water Flow and Balance Simulation Model (WASIM) is a deterministic, spatially distributed hydrological catchment model to simulate the water cycle above and below the land surface.

The R package *R-SWAT-FME* [17] is a comprehensive modeling framework that adopts an R package Flexible Modeling Environment [18], and Soil and Water Assessment Tool model [19]. This framework provides the functionalities of parameter identifiability, model calibration, sensitivity and uncertainty analysis with instant visualization. The Soil and Water Assessment Tool (SWAT) is a semi-distributed hydrological model jointly developed by the USDA Agricultural Research Service and the Texas A&M AgriLife Research. SWAT is a small watershed-to-river basin-scale model to simulate the quality and quantity of surface and ground water and predict the environmental impact of land use, land management practices, and climate change. In SWAT, a watershed is divided into multiple subwatersheds, which are then further subdivided into hydrological response units that consist of homogeneous land use, management, and soil characteristics. SWAT is widely used in assessing soil erosion prevention and control, non-point source pollution control, and regional management in watersheds.

Many optimization functions in R allow for the interfacing of any computer simulation model with them in the calibration process. E.g., function *optim* from the basic stats package provides an implementation of the Broyden-Fletcher-Goldfarb-Shanno (BFGS) method, bounded BFGS, conjugate gradient, Nelder-Mead, and simulated annealing (SANN) optimization methods. The *genalg* package contains *rbga*, an implementation of a genetic algorithm; the *DEoptim* package provides a global optimizer based on a differential evolution algorithm; the *cmaes* package implements a global optimization procedure using a covariance matrix--adapting evolutionary strategy (CMA-ES). As can be seen from its name, the *hydroPSO* package [11] is more specific and is mostly intended for the calibration of environmental and hydrological models. It communicates with a model through the model's own input and output files, without requiring any access to the model's source code. Advanced sensitivity analysis functions, which use Latin hypercube sampling and several functions for the post-processing of the calibration results together with user-friendly plotting summaries that simplify the interpretation and assessment of the calibration results, are available in this package too. *hydroPSO* is parallel-capable in order to facilitate the computational burden of complex models with “long” execution times, which is typically the case when calibrating spatially - distributed hydrological models. R generally contains more of such tools for parallel and cloud computing (e.g., the *snow* package). The mentioned *hydroPSO* package includes a vignette (tutorial) that shows how to calibrate the SWAT-2005 and MODFLOW-2005 hydrologic models in the context of real-world case studies.

Data - driven models analyse and derive results only from the observed input (e.g., in the case of rainfall-runoff modeling, from temperatures, evapotranspiration or rainfall) and output of a modeled system (e.g., a flow in the case of modeling watershed processes); they do not use exact physical laws at all. Data-driven modeling techniques [20-22] may help us understand the value and limitations of what the data can offer. In addition, such models are powerful mergers of information, which are able to handle any kind of data derived from different sources and expressed in different ways [23]. R, as a language for statistics, is particularly competitive in this modeling area in comparison with other software environments. For this reason we will not review in this chapter potential full extent of this subject (there is too much functionality which R can offer in this area for one chapter); only the two following suggestions are given.

The *caret* package [24] contains several tools for developing predictive data-driven models (which could be applied for regression, time series predictions or classification tasks) using the rich set of models available in R. The package focuses on simplifying the training and tuning of the model across a wide variety of modeling techniques (e.g., Neural nets, Random Forest, Gradient Boosting, Machines, SVM, etc.). Using the package, a practitioner can quickly evaluate many different types of models to find the most appropriate tool for his task. Package also includes methods for pre-processing data, calculating the importance of variables, and visualizing models [25]. The second recommendation in the area of supporting the data--driven modeling in R given by the

authors of this chapter is the *rattle* package [26], which after loading and starting in the R environment, offers a clickable GUI, which is specifically designed for data-mining tasks and data-driven modeling (Figure 1).

So-called "conceptual" models describe the main features of an idealized hydrological cycle. The *hydromad* package [27] provides a modeling framework, which supports such a model design (a conceptual model could be composed from the predefined functions of this package), and also offers functions for the simulation, estimation and visualization of the results modeled. The modeling framework in the *hydromad* package (available at hydromad.catchment.org) is based on a two-component structure: (1) a soil moisture accounting module (with various options); and (2) a routing or unit hydrograph module (also with more options). The soil moisture accounting module converts a rainfall and temperature or evapotranspiration into an effective rainfall, and the routing module converts the effective rainfall into a stream flow. A snow routine is available too. Various statistics used in the hydrological modeling evaluation framework and optimization functions are available to fit a hydromad model, e.g., a shuffled complex evolution algorithm, differential evolution algorithm, covariance matrix adaptation evolution strategy or differential evolution adaptive metropolis algorithm. The last named is a Markov Chain Monte Carlo (MCMC) algorithm, which gives estimates of the joint probability distribution of parameters according to a likelihood function. The fitting function returns the maximum likelihood model, but the full MCMC results are also available. Various other tools are available in the *hydromad* package, e.g., tools for the identification and separation of discrete events (both precipitation and flow events) from time series and the application of various graphing and computational functions to them. A graphic user interface for defining discrete events in a time series is also available for this purpose. The *estimateDelay* function uses cross-correlation to estimate the delay between an input time series and (rises in) the corresponding output time series.

Another conceptual hydrological model is available in the *TUWmodel* package. The *TUWmodel* [28] is a lumped conceptual rainfall-runoff model, which follows the structure of the well-known HBV model. The model runs on a daily time step and consists of a snow routine, a soil moisture routine, and a flow routing routine. An example of the model`s calibration, modeling, and evaluation of the results follows.

The variable modeled by the *TUWmodel* was the flow of the Laborec River at the Humenne station (Slovak Republic). As the input data, a time series of precipitation, temperatures, potential evapotranspiration and flows from the period 1981-2005 were used. In the present chapter the authors will not deal with the data preparation, although several functions are available in R for this important task. If, e.g., precipitation data are available for more stations in a watershed, it is possible to use Thiessen polygons to get areas with the precipitation associated with each station (and then it is possible to compute the weighted average of the precipitation). The *dirichlet* function from the *statstat* package and other packages and functions are available for this task. The *idw* function from the *spatstat* package performs a spatial smoothing of the numerical values observed at a set of irregular locations using inverse-distance weighting and could also be used for averaging of the precipitation and similar tasks. The values of the potential evapotranspiration, which are necessary for running the *TUWmodel*, can be obtained by the application of various functions from the *sirad*, *SPEI*, *EcoHydRology* or *r2dRue* packages. In the case of climate change impact studies, a weather generator could be useful for preparing the data in the modeling. The *RMAWGEN* package [29] contains functions for the spatial multi-site stochastic generation of daily time series of temperatures and precipitation.

In the following example of the application of the *TUWmodel*, such data preparation tasks are skipped, and it is assumed that the input data are already available in the following format (text file). In the case of using own data, it must be prepared similarly:

DATE	*Q*	*Z*	*T*	*PET*
1981-3-2	*11.27*	*0.790*	*-1.064*	*0.238*
1981-3-3	*10.86*	*8.701*	*-0.151*	*0.91*
1981-3-4	*10.30*	*0.261*	*2.046*	*0.834*

...

The dataset was divided into the calibration (1981-1995) and validation periods (1996-2005), and then it was read to the R environment by the following statements:

```
LABORECcal <- read.delim("E:/RStudio/Laborec/LABORECcal.txt")
LABORECval <- read.delim("E:/RStudio/Laborec/LABORECval.txt")
```

The modeling itself is accomplished by the *TUWmodel* function. The details about this function can be obtained by a *?TUWmodel* statement written to the R console. These details are mainly information about the parameters which should be specified in this function. These are input data (precipitation, temperatures, evapotranspiration, and the watershed area) and the model parameters, which are necessary to determine for this task. There are 15 such parameters in the *TUWmodel*, which are described in the mentioned help page together with the intervals in which the parameter`s values lie. In the following code, a differential evolution - one of the many optimization functions available in R - is applied to this calibration task, e.g., to searching for the exact values of these 15 parameters within these intervals.

```
# definition of the objective function, necessary for optimization
# task:
fitness<-function(x){
# running TUWmodel with parameters defined by actual chromosome x,
# which is generated by differential evolution – function DEoptim:
simLAB=TUWmodel(prec=as.vector(LABORECcal$Z),
                airt=as.vector(LABORECcal$T),
                ep=as.vector(LABORECcal$PET),
                area=1281, param= as.vector(x))
# extraction of the simulated flows from the simLAB object:
sim<-as.vector(t(simLAB$q))
# computation of the Nash/Sutcliffe coefficient of efficiency
# by the function from the hydroGOF package:
nash<-NSE(sim, as.vector(LABORECcal$Q))
# value of the objective function:
objF=1-nash    #difference from 1 (ideal model) should be minimized
return(objF)
}

# code for running differential evolution, the lower and upper
# are border values for the searched TUWparameters:
DEOP<-DEoptim(fitness,
              lower=c(0.9,0,1,-3,-2,0,0,0,0,2,30,1,0,0,0),
              upper = c(1.5,5,3,1,2,1,600,20,2,30,
                        250,100,8,30,50),
              control = list (itermax=200, NP=200, trace=5))
# modeling of the flows in validation period with optimal
# parameters, which were found by a differential evolution:
simLAB=TUWmodel(prec=as.vector(LABORECval$Z),
                airt=as.vector(LABORECval$T),
                ep=as.vector(LABORECval$PET),
                area=1281,param=DEOP$optim$bestmem)
# evaluation of the results by the ggof function from the hydroGOF
```

```
# package (the result is displayed in Figure 7)
ggof(as.vector(t(simLAB$q)), as.vector(LABORECval$Q),
     dates=as.Date(c(as.Date("1996-01-1"):
     as.Date("2005-12-31"))),
     ftype="dm", FUN=mean)
```

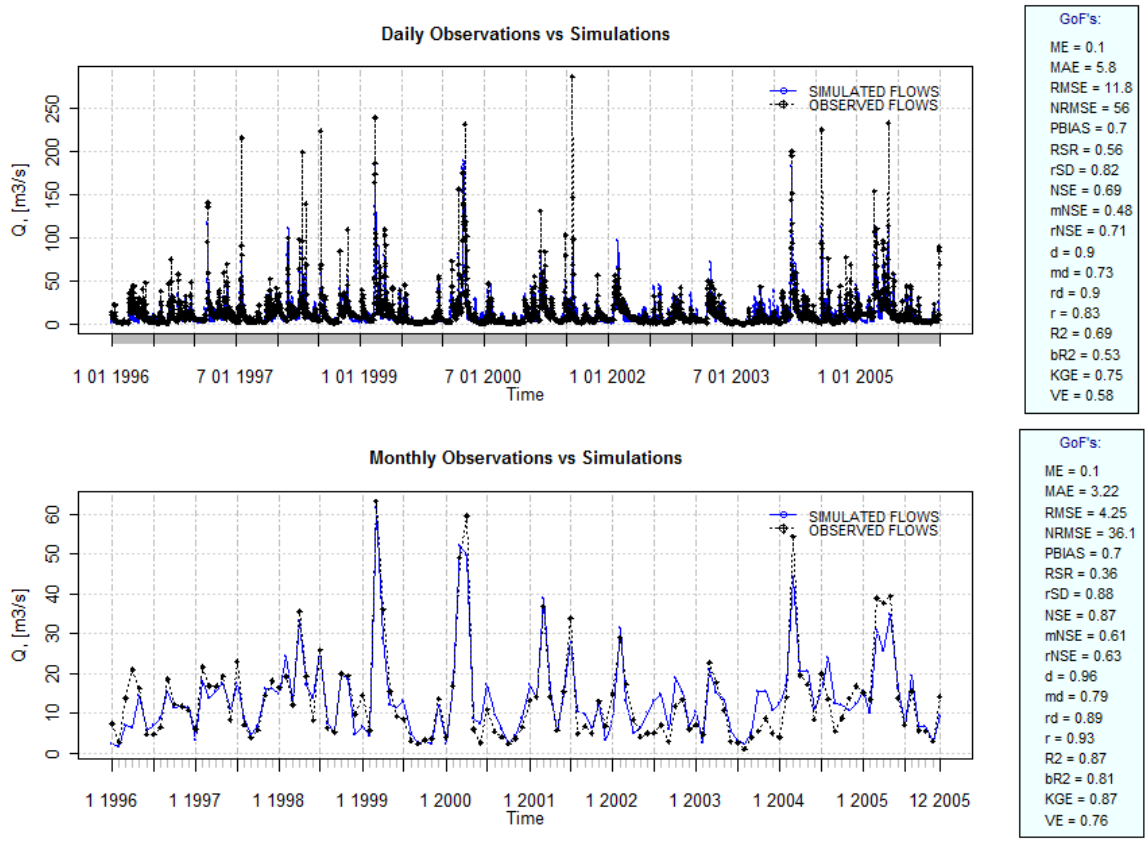

Figure 7. Examination of the modeling results from the output of the *ggof* function.

In Figure 7 the results from the application of the calibrated model to the validation data are evaluated. The graph and associated statistics are produced by the *ggof* function from the *hydroGOF* package [30]. There are various options as to how the resulting graphic evaluation will look when this function is applied – in the case in Figure 7; the daily and monthly evaluations were accomplished by setting the *ftype="dm"* option. The hydrological goodness-of-fit statistics are printed for both of these time scales on the right side of the associated graph (the meaning of the abbreviations is on the help page of this function). It is also possible to obtain these values in a text form with the *gof* function. As can be seen, quite a bit better statistical values are obtained when the same computation is evaluated in a monthly time step, e.g., it might be interesting to compare whether it is not better in the case of modeling monthly flows to use daily inputs and not monthly averages. For more information about this function, it is necessary to write the statement? *gof* on the R console and press Enter.

2.4. Spatial Data Manipulation

R's ability to analyze and visualize data makes it a good choice for spatial data analysis. For some spatial analysis projects, using only R may be sufficient. In many cases, however, R can be used in conjunction with GIS software. It is better not to try to substitute GIS with R if it is necessary to do specialized GIS tasks, e.g., an interactive display or the editing of spatial data. The core R engine was not designed specifically for the display and analysis of maps, and the limited interactive facilities it offers have drawbacks in this area [31].

Various R packages for spatial data exist. They mainly address two areas: moving spatial data into and out of R, and analyzing spatial data in R. There are a number of packages for spatial analysis; what follows is only the tip of the iceberg.

The basic package for the definition of the various types of spatial object structures (e.g., points, lines, polygons or grids) in R is *sp* [31]. Several utility functions are provided in *sp*, e.g., for conversion between data formats, plotting maps, spatial selection and overlays, as well as methods for retrieving coordinates, or for subsetting, printing, summarizing data, etc.

Various packages serve for accessing vector data, e.g., *RArcInfo* [32] allows *ArcInfo* v.7 binary files and *.e00 files to be read; also the *maptools* [33] and *shapefiles* [34] packages read and write ArcView shapefiles and various other formats. The *maptools* package includes a number of useful functions for reading, writing, converting, and otherwise handling spatial objects in R. Unlike their *rgdal* counterparts, the *maptools* functions neither read nor write projection information, leaving it up to the user to manage these details manually. The *maptools* package includes support for the creation of KML files: the file format is used to display geographic data in an Earth browser such as Google Earth, Google Maps, and Google Maps for mobile. The mentioned *rgdal* package [35] provides functions to read and write a lot of grid and vector formats, and it provides access to projection and transformation operations. The *rgdal* package provides an interface to the GDAL/OGR library, which powers the data import and export capabilities of many geospatially aware software applications. The package includes the *readOGR* and *writeOGR* functions for reading and writing not only shapefiles, but also numerous other vector-based file formats. In addition, the *ogrInfo* function is useful for retrieving details about a file without reading in the full dataset. These functions are all capable of automatically reading and writing projection information if available.

The following code is a basic demonstration of the reading and visualization of a grid and vector data by the *maptools* and *sp* packages. Again, running it with own data is easy, only 2 shapefiles and one ascii grid file is necessary.

```
setwd("E:\\RStudio\\Bela")      # set working directory
library(maptools)               # load package for reading GIS data
library(lattice)                # graphing package

# read the DEM and the vectors in shape files by maptools package
# functions to objects):
bela_DEM  <- readAsciiGrid("elevation.asc")
bela_rivers  <- readShapeLines("rivers")
bela_border  <- readShapeLines("watershed")

# defining the vectors and their basic properties for plotting
# (color and width of lines):
rivers <- list("sp.lines",bela_rivers, col="blue", lwd=0.5)
border <- list("sp.lines",bela_border, col="black", lwd=1)

# defining various other objects and texts to draw:
scale <- list("SpatialPolygonsRescale",
        layout.scale.bar(height=0.05),
        offset = c(-357500,-1194000),
        scale = 5000, fill=c("transparent","black"))
text1 <- list("sp.text", c(-357500,-1195000), "0")
text2 <- list("sp.text", c(-351700,-1195000), "5 km")
```

```
text3 <- list("sp.text", c(-368000,-1178000),
            "Bela river watershed",
            cex=1.5)
arrow <- list("SpatialPolygonsRescale",
            layout.north.arrow(type=1),
            offset = c(-355500,-1193000), scale = 2000)

# set some nice topographic colors
colors <- terrain.colors(1000)
trellis.par.set(sp.theme(regions=list(col = colors)))

#final plot plotted by sp package function spplot: (Figure 8)
spplot(bela_DEM,draw = T, colorkey=list(space="right",
                                height=0.5),
      cuts=500,scales=list(draw=T),
      sp.layout=list(scale,text1,text2,text3,
                arrow,rivers,border))
```

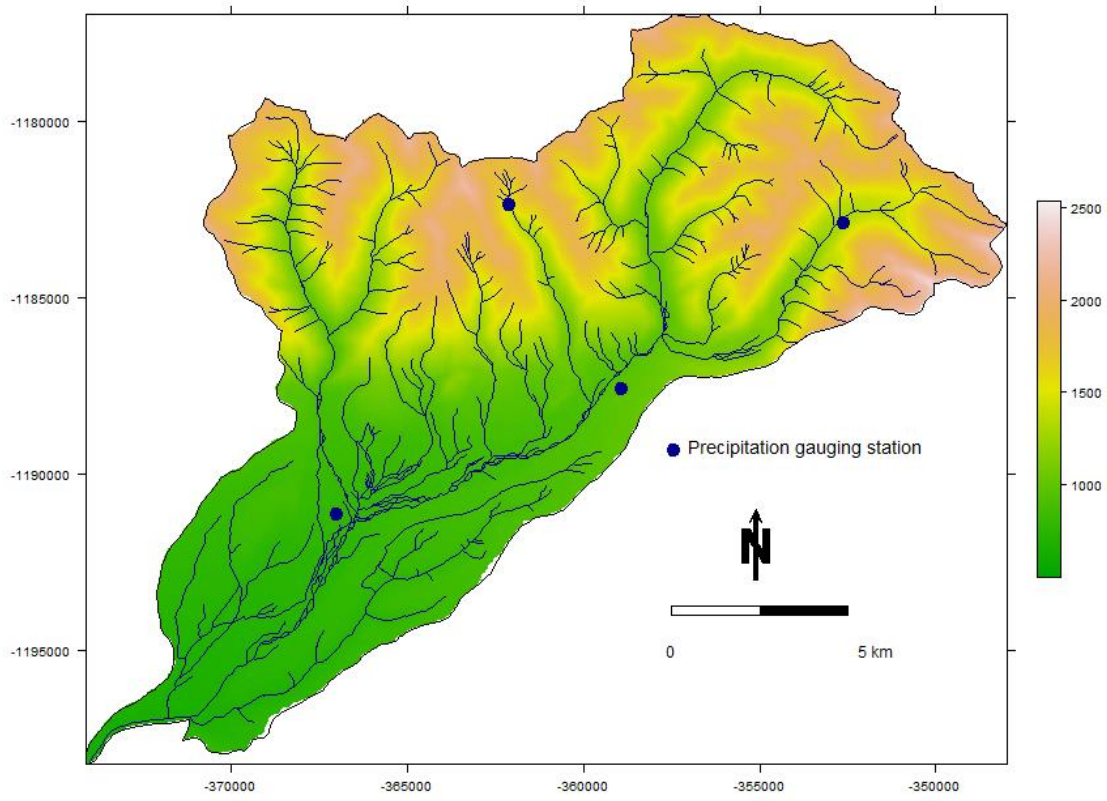

Figure 8. Simple display of GIS data by *spplot* function.

The *raster* package [36] provides access to data in raster formats and includes analytical tools for this type of spatial data. Raster data divides space into cells of equal size. Such continuous spatial data are also referred to as "grid" data, and can be contrasted with vector-based spatial data (points, lines, polygons). The raster package provides, among other things, the creation of raster objects from scratch or from a file, the handling of extremely large raster files, raster algebra and overlay functions, distance functions, polygons, lines and points to raster conversion, summarizing raster values, easy access to raster cell values, plotting, reading and writing various

raster file types. The *rasterVis* package complements [37] the raster package, which provides a set of methods for enhanced visualization and interaction.

Vector data manipulation, e.g., topology operations on geometries, are accessible with the help of the functions from the *rgeos* package [38]. It contains many functions for handling, combining, and querying points, lines, and polygon types of spatial data. The package's functionality is based on the GEOS library, which is a C++ port of the Java Topology Suite (JTS). The available functions fall into three main classes: miscellaneous functions such as *gArea* (which calculates the area of a given geometry), topological queries (e.g., *gContains* - a function for testing whether one geometry is contained within another geometry), and topological operations (e.g., *gIntersection* - a function for determining the intersection between two given geometries). Some operations are unary, taking one vector object, while others are binary, taking two objects. There is more than one hundred of such functions available in the *rgeos* package.

The *gstat* package [39] offers a wide range of univariable and multivariable geostatistical modeling methodologies, prediction and simulation functions, variogram modeling, variogram map plotting, everything from simple global kriging to local universal cokriging, multivariate geostatistics, block kriging, etc. The *geoR* package [40] includes functions and methods for reading and preparing the data, exploratory analysis, inferences of model parameters, including variogram-based and likelihood-based methods, and spatial interpolation. Furthermore, it implements simple, ordinary, universal and external trend kriging. The package also implements Bayesian methods, which take the parameter uncertainties into account when making predictions at specified locations.

The *mapplots* package [41] serves for visualization purposes; its main purpose is to add sub-plots to a map. The *basemap* function from this package creates a blank map. Other GIS layers can be added with a function for drawing shape files. For univariate data, functions for bubble plots and heat maps are available; multivariate data can be displayed with square pie plots, pie plots or barplots.

The *RPyGeo* package [42] provides access to (virtually any) ArcGIS geoprocessing tool from within R by running Python scripts without writing Python code or the direct usage of ArcGIS GUI. At least the ArcGIS version 9.2 and a suitable version of Python are required. The *spgrass6* [43] package offers an interface between the GRASS 6+ geographical information system and R. The interface between GRASS 6 and R has been used in research in a number of fields, for example, by Haywood and Stone [44], which is interesting in that it uses the interface to apply the Weka machine learning software suite, which itself is interfaced to R through the *RWeka* package [45]. R then becomes a useful bridge between various tools that open up other possibilities beyond R. RSAGA provides access to the geocomputing and terrain analysis functions of SAGA from within R by running the command line version of SAGA (www.sourceforge.net/projects/saga-gis/files/).

Web-based services are becoming ever more important channels for exchanging spatial data. The *RgoogleMaps* [46] package provides tools to access Google Maps data in an image form using the Google Static Maps API, in order to permit background maps to be used in R. The *ggmap* package allows for the easy visualization of spatial data on top of Google Maps, OpenStreetMaps, Stamen Maps, or CloudMade Maps using *ggplot2*. *ggplot2* [47] is one of the most popular packages in R intended as an alternative for data visualization; it is based on Leland Wilkinson's grammar of graphics. It provides a scheme for data visualization, which breaks up the creation of graph into a layers. In *ggmap* usage, a basic layer, e.g., from Google Maps, is firstly downloaded, and then its object is created in R. Then other layers with lines, points, polygons, texts and other features from various sources are added to it according to its rules of syntax. Vector data from OpenStreetMap is also available for downloading by using the recently contributed *osmar* package [48].

2.4. Soil Hydrology

The *soilwater* package [49] provides soil water retention functions, soil hydraulic conductivity functions, and pedotransfer functions. The water retention curve is one of the main hydraulic soil properties, which is used in

simulating the water regime of soils. It represents the relationship between the water content and the soil water potential (the potential energy of water per unit volume, which quantifies the tendency of water to move from one place to another). This curve is distinctive for different types of soil. It is used to predict soils water storage, the water supply to plants, and other tasks in soil water modelling. Pedotransfer functions are used for determining the water retention curve from more easily available soil properties such as particle size distribution, dry bulk density, organic C content, etc.
The *soilwaterfun* package [50] is a collection of widely used soil water retention functions by various authors

[51] and soil hydraulic conductivity functions (Mualem-van Genuchten, Brooks & Corey, Campbell). The *soilwaterptf* package [52], is a collection of so-called "pedotransfer functions" (PTFs) for estimating the parameters of soil water retention and hydraulic conductivity functions from easily available soil properties (typically the texture, organic carbon content and bulk density). The package provides functions that implement pedotransfer functions for predicting the parameters of the Mualem and the van Genuchten water retention functions and hydraulic conductivity functions. These functions are used to predict soil hydraulic properties when no measurements are available.
Other projects exist that provide useful soil-related R functions, e.g:

- The *soiltexture* package [53], which provides functions for soil texture data in R. The available functions can (1) plot soil texture data (2) classify soil texture data, (3) transform soil texture data from and to different systems of particle size classification systems, and (4) provide some tools to 'explore' soil texture data (in the sense of a statistical visual analysis).
- *HydroMe* [54] - estimation of soil hydraulic parameters from experimental data. The HydroMe package estimates the parameters in infiltration and water retention models by the curve-fitting method. The models considered are those that are commonly used in soil science.
- The *ZeBook* package [55] is an R package accompanying the book "Working with Dynamic Models for Agriculture and the Environment" [56]. It contain the well-known Watbal water balance model, which calculate soil water over a designated time period and various dynamic models of crop growth.

[52] Conclusions

In this chapter a selection of possibilities offered by the R development core team, as well as by the work of various contributors in the areas of hydrology and water resources management, was described. Because of the limited space, this chapter was not intended as a detailed description with tutorials; instead, it is an overview of the possibilities available in this software environment, which could serve as an inspiration for readers if they are considering using R in their hydrological analyses. Some hydrologic topics are presented only briefly, and some subjects were not described at all, although the tools for them exist in R (e.g., weather and climate--related subjects, time series, regional hydrology, etc.). As can be seen, there are a useful collection of options, even on a level where the user is actually not programming something. It is necessary to know the basic syntax of the language, but what was basically presented in the chapter were ready-made functions. The only obstacle for less-experienced users could be that these functions are not managed by a clickable GUI, but through a command line interface. Moreover, in the case of also exploiting all the programming possibilities of R, the effect of using R for water practitioners or scientists will be even more useful. Although having a tool is not enough for serious work which involves other subject-related theoretical and practical knowledge and skills, a tool such as R is very useful, e.g., in the process of learning some difficult subject related to an analysis of hydrological data (e.g., copulas, to mention one). In R one has the possibility of easily trying corresponding computations, which are otherwise only described by complicated theories. Of course, it is necessary to know the background of the computations, but it is very helpful in the process of learning some intimidating and complicated subject, if one knows that he can do the very thing which he is trying to understand. This is supported by a unified system as to how the so-called S3 and S4 functions of R are written. For the R user it means that there is not a big difference in exploiting R's possibilities if he is interested in the capabilities of GIS or the mentioned copula computations. R is also an interesting social phenomenon with enthusiastic features in its user community; often someone makes such complicated tasks easier by offering appropriate tools, e.g., GUIs, which help to do basic tasks in such areas easily and intuitively (e.g., from the items described hereinbefore, the extremes package for an extreme value analysis is a good example of this point, which is a de facto wizard that uses computational engines from other packages). Many R functions are wrap programs, which are written in FORTRAN, Java, C++, etc., which often makes it easier to use these programs. Moreover, an advantage is obtained when the opportunity arises to use them in a stream with the other software packages available in R. This could produce an interesting synergistic effect, at least in terms of productivity.

Because the packages contributed are the result of voluntary efforts, there is no guarantee which methods based on such a genesis exist in R. As has already been mentioned, users may need to be prepared to do a little work to find what they need, e.g., to be prepared sometimes for a little digging. Besides the disadvantages associated with it (e.g., we will not find something, because no one has done this very thing, or because somebody stopped caring about it), due to the enthusiastic elements in the R community, some existential pleasure, which is associated with treasure hunting, as a result of such digging, is often attained as a reward.

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Female Superintendents and the Effects of Mentoring Relationships

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Abstract

Women make up the majority of personnel in today's school systems yet few are employed in the highest position-superintendent. In one southern state, the State Department of Education (2009) reported 22 % of superintendents were women. Nationwide, the percentage is 24.1% (Kowalski, McCord, Petersen, Young, & Ellerson, 2011). However, in comparison to the number of women who begin their careers in education, there is still a wide inequity between the percentages of those in the ranks and those in positions of superintendent (Katz, 2012). One of the reasons for the lack of women in upper level administration is the lack of mentoring, both formal and informal. Therefore, mentoring becomes an essential element in providing the guidance and support for women who aspire to be in a leadership position.

This study examined the effects of career and psychosocial mentoring functions on the careers of women superintendents currently serving in a southern state by exploring both informal and formal mentoring relationships and the way these relationships serve as effective tools on the position attained and career development. The results of this study showed that the career mentoring functions and psychosocial mentoring functions had a statistically significant impact on the careers of female superintendents. Findings from this research indicate that mentoring relationships have the potential for female administrators to make successful career advancement.

Keywords: Career mentoring, psychosocial mentoring, women in leadership

Introduction

Historically women in education are disproportionately represented at the highest positions of educational leadership, especially in comparison to the number who begin careers as teachers. Feistritzer (2011) reported eighty-four percent of the teaching work force were women, however, only twenty-four percent of superintendents were women (Kowalski, McCord, Petersen, Young, & Ellerson, 2010). The number of female superintendents has been increasing over the years; 6.6 % in 1992, 13.2 % in 2000 (Glass, Bjork, & Brunner, 2000) and 24% in 2010 (Kowalski, et al, 2010). But, the nation's 14,000 district superintendents are still overwhelmingly white and male (Gewertz, 2006). In one rural southern state in 2009 of the 133 superintendents, 22% were women (State Department of Education, 2009). Grogan (2000) believed the need for increased knowledge and skills to help make sense of the immense amounts of information in the position of superintendent is an important concern of the 21st century leader. It is suggested that the US public school superintendents are understood to be a male's role, and women who inhabit this role will inevitably have difficulties caused by their femininity (Skrla, 2000). One of the reasons for the lack of women in upper level

administration is the lack of mentoring, formal or informal, for women to advance in careers or who are aspiring to the position of school superintendent. Hence, mentoring becomes essential in providing guidance and support for women who seek to become a superintendent.

Organizations are gradually acknowledging the benefits of mentoring relationships. More than 70% of Fortune 500 companies use mentoring to attract, develop and good retain employees (Kovnatska, 2014). It has also become increasingly popular in teacher education and school administrator development (Zerzan, Hess, Schur, Phillips, & Rigotti, 2009) and has been recognized as a significant component of faculty development (Tareef, 2013), career advancement, in addition to educational and personal development.

There are numerous studies on mentoring as an accepted and vital part of the developmental process in many professional fields (Moir, 2009; Smith, 2011). Still, there is limited research on the influences and benefits of mentoring relationships and the effects on the career development of newcomer administrative leaders, especially women (McDowell-Long, 2004; Walker & Carr-Stewart, 2006). As a result, mentoring relationships that provide both career development and psychosocial functions (Dunbar & Kinnersley, 2011) are particularly important for women in educational leadership to strive to top-level administrative positions in education.

The purpose of this study was to examine the career and psychosocial mentoring functions on the career development of women superintendents currently serving in a rural southern state. Explored in this study were both informal and formal mentoring relationships and in particular the way these relationships served as effective tools on position attainment and career development.

Mentoring

The art of mentoring is not a new concept. Its origin date back at least 3000 years to Greek mythology in Homer's Odyssey (Kovnatska, 2014). Mentor was a teacher and friend of King Odysseus who was entrusted to care for his son Telemachus while fighting in the Trojan War. During King Odysseus's absence, mentor educated and guided Telemachus. The mentor is frequently referred to as being a "wise and experienced man" (Steiner, 2014, p.702). However, the concept of mentoring involves more aspects than in Telemachus function. Today, mentoring is simply a process in which a more experienced person supports a less experienced person in his/her professional and personal growth (Beckett, 2010); and is defined in terms of the functions (processes) performed by the mentor (Colley, 2002; Young & Wright, 2001). It is a reflective practice that requires engagement, time and ongoing dialogue (Parker, Hall, & Kram, 2008). Career Mentoring Function

If mentoring is going to be successful in the professional arena, then interactions must exist between the mentor and the protégé. The interactions should include activities that will help to promote the protégé. The most extensive research on mentoring came from Kram's (1985) in which mentoring is defined as an interpersonal relationship between a more experienced employee and a less experienced employee to enhance career development. This qualitative study categorized mentoring into two functions: career and psychosocial functions. Career functions are those aspects of the relationship that enhance career advancement (Kao, 2014). The functions are primarily designed to develop and refine professional knowledge and skill (Johnson, 2007). Career mentoring functions provided to protégés include exposure and visibility, coaching, sponsorship, protection, and assigning challenging projects (Kram, 1985).

Both sponsorship and exposure and visibility involve the mentor providing public support for the protégé. This can involve the mentor providing recommendations or nominations (sponsorship) on behalf of the protégé or introducing (exposure and visibility) the protégé to key people in the organization (Baranik, Roling, & Elby, 2010). The goal is to make the protégé visible in positive ways and give key people in the organization a chance to see the protégé's potential. Another way to enhance career development for protégés is through coaching. The coach helps the protégé understand the political dynamics of an organization and how those dynamics can be used for career advancement. Providing challenging assignments additionally allows the protégé a chance to

develop and showcase skills while receiving support from the mentor who can serve as a shield if untimely or potentially career damaging situations occur.

Psychosocial Mentoring Functions

Psychosocial functions are another aspect in the mentoring relationship. Acceptance and confirmation, counseling, friendship, and role modeling are examples of psychosocial functions (Kram, 1985). The primary objective of these activities is to improve the protégés sense of self and social relations within the environment (Davidson & Foster-Johnson, 2001) and the main reason for seeking external mentors (Patton, 2009). The psychosocial functions are those aspects of the relationship that enhance a sense of identity and effectiveness in a professional role (Kao, 2014).

Acceptance and confirmation allows both mentor and protégé to gain a sense of self through relationships by building on trust. This encourages the protégé to take risks and venture into unfamiliar activities that is often characterized by mutual social interactions more like a good friend or teacher (friendship). Another way to enhance the psychosocial mentoring development of protégés is through counseling which enables the individual to discuss internal conflicts as well as being a being able to express concerns regarding the conflicts. Mentors also embody the skills and behaviors (role modeling) necessary for successfully inhabiting a certain role (Mason & Bailey 2003). Through counseling and role modeling the protégé has someone available to provide social and emotional support, and affirmation.

The benefits of career and psychosocial mentoring functions are supported by researchers (Stamm, 2011; Tareef, 2013), which are designed to eventually advance leadership opportunities for female leaders. Ultimately, mentoring relationships (career and psychosocial) enable the protégé to transfer knowledge and experiences (Guillot, 2014).

Mentoring and the Superintendency

Although still significantly underrepresented as superintendents in comparison to percentages in teaching, women have made some gains in attaining the position of superintendent in the last decade (Jackson & Shakeshaft, 2003) mostly attributed to mentoring. According to McClellan, Ivory, & Dominquez (2008) results from a focus group of 50 new superintendents from seven states contends that it is important to support each other through mentoring by having opportunities to learn from more experienced superintendents. Additional results suggested that other aspects should be addressed in the mentoring relationship such as negotiating contracts, understanding board policies and politics, developing budgets, and working with parents and personnel. Gilmour and Kinsella (2009) also studied several dozen female superintendents across the state of New York and suggested that aspiring superintendents find two mentors, one in the field of education and one outside the field of education. This recommendation was deemed helpful because the protégé would have an expert in the field of education and one outside to give support and feedback.

Women seeking the superintendent position are “crawling through the window of a dream” in order to survey the terrain of the Superintendent (Brunner, 1999, p. 8). Mentoring relationships can greatly shape women’s growth and potential in school leadership by boosting confidence and developing a sense of connection and identity as a leader (Gardiner, Enomoto & Grogan, 2000). However, women are omitted from vital mentoring relationships and being excluded results in a negative cycle whereby women lacking mentors are less likely to advance and more inclined to leave the practice (Kay, Hagan, & Parker, 2009). Women are identified and trained to become a principal however; encouragement towards the becoming a superintendent must be intentional and purposeful (Alston 2000).

Purpose of the Study

The purpose of this study was to examine the effects of career and psychosocial mentoring functions on the careers of women superintendents currently serving in a southern state. Both informal and formal mentoring relationships were explored and the way these relationships served as an effective tool on position attainment and career development. Although more is known about the nature of mentoring benefits, less is known about the relationships that women experience (Packard, Walsh & Seidenberg, 2004). This study contributes to the small body of literature on mentoring of women, especially those in the position of superintendent. This study was guided by the following research questions: 1) to what extent have women superintendents of a rural southern state been mentored? 2) to what extent have career-mentoring functions influenced the career advancement of women superintendents of a rural southern state? And 3) to what extent have psychosocial-mentoring functions influenced the career advancement of women superintendents of a rural southern state?

Methods

A researcher-designed survey was used to conduct this study. The survey instrument was based on the *Career and Psychosocial Mentoring Functions Questionnaire* (Hall, 2001; Wesley, 1997), the *Kinnersley Mentoring Survey* (Kinnersley, 2009), and the *Mentoring Questionnaire* (Giddis, 2003). An independent panel of experts, a pilot study with a selected sample of educational administrators, and statistical analysis were used to substantiate the validity of the instrument. Internal reliability was assessed using Cronbach's Alpha test. The results from the internal consistency reliability test yielded a .991 Cronbach's alpha coefficient score. The final draft of the survey comprised 20 questions divided into two sections. Section I posed four items related to demographics data. Section II, mentoring functions profile, consisted of twenty items pertaining to the perceived value of the mentor's helpfulness regarding the career and psychosocial functions on career advancement. The participants responded to each of the 20 Likert-type questions and was scored on a 1 to 5 scale that includes the following response: 1=strongly disagreed, 2=disagreed, 3= undecided, 4=agreed and 5=strongly agreed.

The research population consisted of women who were currently serving as superintendents and assistant superintendents during the 2009-2010 school year. The State Department of Education reported 133 superintendents in the state with only 22% being women in addition to twenty-nine assistant superintendents. The population is relatively small so all female superintendents and assistant superintendents were surveyed. The names and address of the female superintendents and assistant superintendents were obtained from the State Department of Education Directory (2009).

Results

Research question one asked, "To what extent have women superintendents of this state been mentored?" The data analysis was completed using 28 participants (N=28 participants). The results of the surveys indicated that 62% of women surveyed have been mentored. The superintendents and/or assistant superintendents were all women; however their most significant mentor was male (53.6%) in comparison to 46.4 % female and Caucasian (71.4%) in comparison to 28.6% African American.

Research question two asked, "To what extent has career mentoring functions influenced the career advancement of women superintendents? The results of the ANOVA test (Table 1) indicated a statistically significant difference in means when comparing career means to the overall survey mean ($p<.01$). The strength of the relationship between the career means and overall mean scores, as assessed by η^2, was high accounting for 98% of the variance on the dependent variable.

Table 1

Career means compared with the overall mean

			Sum of Squares	df	Mean Square	F	Sig.
Overall * CareerMean	Between Groups	(Combined)	10.646	17	.626	34.630	.000
	Within Groups		.181	10	.018		
	Total		10.827	27			

Measures of Association

	Eta	Eta Squared
Overall * CareerMean	.992	.983

Research question three asked, "To what extent have psychosocial mentoring functions influenced the career advancement of women superintendents in a rural southern state?" The results of the ANOVA test (Table 2) indicated a statistically significant difference in means when comparing psychosocial means to the overall survey mean ($p<.01$). The strength of the relationship between psychosocial means and overall mean scores, as assessed by η^2, was high accounting for 82% of the variance on the dependent variable.

Table 2

Psychosocial means compared with the overall mean

			Sum of Squares	df	Mean Square	F	Sig.
Overall * PsychoMean	Between Groups	(Combined)	8.973	12	.748	6.052	.001
	Within Groups		1.853	15	.124		
	Total		10.827	27			

Measures of Association

	Eta	Eta Squared
Overall * PsychoMean	.910	.829

Analysis of variance (ANOVA) statistic was used to measure the differences between groups on specific career and psychosocial mentoring functions. ANOVA was conducted to determine if there were significant differences between the career mentoring functions of teaching, coaching, exposure/visibility, sponsorship and assigning challenging tasks and the psychosocial mentoring functions of role modeling, acceptance/confirmation, friendship, and counseling. The level of significance was set at the .05 level. Table 3 presents the results of the one-way analysis of variance for career mentoring functions. Table 4 presents the results of the one-way analysis of variance for psychosocial mentoring functions.

Table 3
Survey of results of one-way ANOVA for career mentoring functions

Variable	MSE	F	p	Eta^2
Teaching	2.55	8.92	.000	.718
Coaching	2.769	28.94	.000	.910
Exposure/Visibility	3.03	20.52	.000	.854
Sponsorship	3.09	23.79	.000	.686
Challenging tasks	4.67	41.04	.000	.877

Findings indicated that there was a statistically significant difference between the career mentoring functions of teaching, coaching, exposure/visibility, sponsorship and assigning challenging tasks. Because the overall F test was significant, the strength of the relationship between each function of career means and overall mean scores was assessed by η^2. The η^2 of .91 for coaching indicated the strongest relationship between the variance on the dependent variable.

Table 4
Survey of results of one-way ANOVA for psychosocial mentoring functions

Variable	MSE	F	p	Eta^2
Role Modeling	1.04	19.02	.000	.869
Accept/confirm	1.51	40.95	.000	.903
Friendship	2.27	34.50	.000	.812
Counseling	1.83	39.97	.000	.874

Findings indicated that there was a statistically significant difference between the psychosocial mentoring functions of role modeling, acceptance/confirmation, friendship, and counseling (Table 9). Because the overall F test was significant, the strength of the relationship between each function of psychosocial means and overall mean scores was assessed by η^2. The η^2 of .90 for acceptance/confirmation indicated the strongest relationship between the variance on the dependent variable.

ANOVA was conducted to evaluate the relationship between gender (male or female) of the mentor and the overall mean scores from the survey instrument (Table 5). The independent variable, gender factor, included two levels: male and female. The dependent factor was the overall mean scores from the survey that measured career and psychosocial mentoring functions. The ANOVA results for gender, was not significant, $F(1,26) = 2.27$, $p = .14$. The strength of the relationship between gender and overall mean scores, as assessed by η^2, was low accounting for 8% of the variance of the dependent variable. Table 6 reports the means and standard deviations.

Table 5
Gender ANOVA

			Sum of Squares	df	Mean Square	F	Sig.
Overall * Gender	Between Groups	(Combined)	.869	1	.869	2.270	.144
	Within Groups		9.957	26	.383		
	Total		10.827	27			

Table 6
Mean and Standard Deviation for gender

Gender	Mean	N	Std. Deviation
male	4.1000	13	.77163
Female	4.4533	15	.44820
Total	4.2893	28	.63324

Discussion

The purpose of this study was to examine the impact of mentoring relationships on the career of women superintendents of a rural southern state. The results of this study showed that the career mentoring functions and psychosocial mentoring functions have a statistically significant impact on the careers of female superintendents. It can be concluded from this study that career mentoring functions, in particularly coaching, and psychosocial mentoring functions, acceptance/confirmation, helped influence the career development of female superintendents. Findings from this research indicate that mentoring relationships have the potential for female leaders to make successful transitions into the role of superintendent and career advancement. Godshalk & Sosik (2000) conducted a study and support the importance of acceptance/confirmation as one of the most important elements of effective mentoring relationships. However, in order to maximize career success, professionals should cultivate mentoring relationships throughout the career process (van Eck Peluchette & Jeanquart, 2000). Findings from this study support similar research outcomes that acknowledged the role of the mentor as a significant factor in psychosocial development (January, 2006) and career development (Tareef, 2013). Similar results have also been found in another study identifying the career mentoring function of coaching as an important factor in career advancement (Beres & Dixon, 2014); because mentoring has been linked to both job and career success.

Summary

The benefits of mentoring for professionals are well documented, yet gaps remain in the literature addressing the effects on mentoring for female leaders. Research on women as superintendents has been limited because there are a limited number of females in these positions; however, even a small sample can prove valuable to the understanding of this selective group (Beekley, 1999). The need for more women in the superintendent's role is highlighted in this study due to the small survey population. However, current female superintendents can be more actively involved in the development, growth, and endurance of mentoring programs for newly appointed and aspiring female superintendents. Since the pool of potential same gender mentors is limited, those leaders in higher-level administrative positions should be more proactive in providing mentoring to aspiring female administrators to assist with developing and increasing the number of female superintendents. The profession should take the role of creating a different culture for the induction and mentoring of new administrators (Jacobson, Hickcox, & Stevenson, 1996).

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The Influences of Disabilities Acceptance, Knowledge about Inclusive and Interaction with Disabilities Peoples on Trainee Students' Attitudes to Educate Intellectual Disabilities in Regular Settings.

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Abstract

The study was conducted in Jazan University- Faculty of Education during academic year 2014-2015. Objectives: to identify to what extent that impact of disabilities acceptance, knowledge about inclusion and interaction with disabilities Children on Attitudes of Trainee Students to educate individuals with intellectual disabilities in regular settings. Method: Descriptive statistic methods was adopted. Researchers used the Trainee Students scale to measure trainee students' attitudes toward include students with disabilities in general classes. Study group included 420 Trainee Students. 72 Trainee Students were selected randomly as study sample. Results: the results of study show that disabilities acceptance, knowledge about inclusion, and Interaction with disabilities influenced on trainee students' attitudes to educate individuals with intellectual disabilities in regular settings. Therefore, all trainee students need to be more aware of the inclusive options through training courses and workshop.

Keywords: *Trainee Students, Inclusion, Disabilities Acceptance, Interaction with Disabilities.*

1. Introduction

Inclusion is an educational practice based on the premise of social justice that advocates equal access to educational opportunities for all students regardless of physical, intellectual, emotional or learning disability. Inclusion involves students with disabilities learning with their peers in regular schools that adapt and change the way they work in order to meet the needs of all students (Foreman, 2001).

To be successful, inclusion requires commitment from governments, teacher-training institutions, schools, the school community and most importantly, from individual teachers. Preparing teachers for regular class teaching has undergone a major pedagogical shift in recent years. Training institutions are now required to ensure that pre-service teachers are competent to cater for the needs of an increasing range of diverse learners. The importance of having positive attitudes toward inclusive education amongst in-service educators has also been long recognized. If educators hold positive attitudes towards inclusive education it may allow and encourage practices that will further, to a large extent, successful inclusion of all students (Hobbs & Westling, 1998) Positive attitudes can be and need to be fostered through both training and positive experiences with students with disabilities.

Trainee Students' attitudes can be influenced by contact with people with a disability, knowledge of disability act/policies and level of confidence in teaching students with disabilities and training in special needs. There was a study conducted by Thaver & Liau (2014), revealed that interaction with individuals with special needs and previous training in disabilities significantly influence attitudes. In addition, researchers indicated that trainee educators had more interactions and contacts with people with disabilities obviously revealed higher positive attitudes to educate children with special needs in general classes than trainee educators did not have.

Moreover, researchers indicated that trainee educators had more previous training to educate people with disabilities in inclusive settings obviously revealed higher positive attitudes to educate children with special needs in general classes than trainee educators did not have. A study conducted by Sharma, & Desai (2012), found that participants who had training courses in special education were more confident to educate individuals with special needs in general classes too. In addition, they indicated that training positively influenced participants' attitudes and improved their confidence to educate children with special needs in general classes. There is a study conducted by Toole, & Burke (2013), exposed that there were negatively strong relationships between school climate and increased concerns inclusion. For example, Trainee Students who negatively expressed their school climates revealed lower levels of PE In contrast, participants believed in their abilities to educate children with special needs in general classes revealed less concerns about inclusion. There was a study conducted by Cameron, & Cook (2007), indicated that special education teachers' attitudes pertaining planning and accommodations, educational qualifications, program of study, training in special needs and contact with disability to educate people had intellectual disabilities were more positive than attitudes of future general teachers. There was a study conducted by Malak (2013), indicated that considerable variances among the attitudes of the Trainee Students had field training in inclusive settings and pre- service educators did not. To clarify, participants had field training in inclusive settings revealed more positive attitudes than those without training. Researchers told that considerable variances among the attitudes of the pre- service educators had close contacts and pre- service educators did not. To clarify, participants interacted with individuals with disabilities revealed more positive attitudes than those without who did not. There was a study conducted by Ajuwon, & et al (2012), indicated that Trainee Students' attitudes towards inclusive education were pointedly enhanced after teaching an introductory course in special education to all pre- service educators. Researchers exposed that Trainee Students highly held confidence to educate people with special needs revealed more positive attitudes than those who did not. Likewise, they indicate that Trainee Students highly had interactions and experiences with students with special needs revealed more positive attitudes than those who did not. There was a study conducted by Costello, & Boyle (2013), indicated that students did not reveal positive attitudes towards training and perceived competence, and those attitudes turned out to be less positive over the years of study. There is a study conducted by Mangope, Mannathoko, & Kuyini (2013) indicated that training was related to more positive attitudes to include individuals with disabilities: researchers attributed college students' concerns to include students with disabilities to some external factors such as insufficient knowledge and skills to well educate individuals with disabilities as well. There is a study implemented by Woodcock, (2013), found that Trainee Students' attitudes were influenced by training to use different method of curriculum delivery. There is a study conducted by Loreman, Sharma, & Forlin (2013) indicates that there were statistical differences among college students had no or low experience, confidence, preparation or knowledge in an area, and students revealed better responses. In general, college students, who held lower levels of knowledge and awareness, experience, confidence or preparation, revealed lower attitudes of teaching self-efficacy to include pupils with disabilities. Additionally, Trainee Students' attitudes toward applying inclusive education can be influenced by modifying a method that can be educationally useful to make accommodations to teach children with severe disabilities in general classrooms. There is a research study that was conducted by Campbell, Gilmore & Cuskelly (2003), showed that, at the end of semester, Trainee Students presented affirmative dispositions towards including pupils with Down syndrome, and when interacting with people with disabilities, teachers' attitudes towards disability in general improved to the acceptance of the differences. In addition, knowing more about significance of disabilities may guide to changes in attitudes and dispositions towards disability in general. In conclusion, making accommodations and additional methods to teach children with severe disabilities in general classrooms can affect teachers' attitudes toward applying inclusive education to students with severe disabilities. There is a study conducted by Sharmaa Moorea, & Sonawaneb (2009), indicated that interactions with children with disabilities would positively influence trainee educators' attitudes and might considerably

decrease concerns and worries to educate children with special needs in inclusive classes. There a study implemented by Taylor, & Ringlaben (2013), indicated a considerable variance existed between answers before and after taking training course. Researchers indicated educating people with disabilities would promote participants revealed that acceptance of diversities by typical pupils in general classes. There is a study implemented by Pedersen, Cooley, & Hernandez (2014), found that college students had more time to train had positive beliefs, attitudes, and intentions toward inclusive education than their counterparts had less training time, but researchers indicated that variances among trainee students' responses were based on university attended.

Aims of study:

The aims of study are:

- To know the influence of disabilities acceptance on attitude of Trainee students toward inclusive.
- To understand the role of knowledge about inclusive and disability on attitude of Trainee students toward inclusion.
- To indicate impact of interaction with disabilities on trainee students toward inclusive.

Study questions:

To verify these aims the researchers, the following questions should be answer:

1- What is influence of disabilities acceptance on attitude of trainee students toward inclusive?

2- What is influence of knowledge about inclusive and disability on attitude of trainee students toward inclusive?

3- What is influence interaction with disabilities on attitude of trainee students toward inclusive?

Methods and Tools:

Method Research Approach:

In this study, the descriptive survey design was adopted.

Study group:

Study group formed from (420) trainee education students in faculty of education – University of Jazan. K.S.A. distributed in three specialization (Special Education- Art Education- Physical Education).

Study sample.

In these research random sampling methods was used. The individuals who participate in random sampling were chosen randomly. The study was conducted with (72) students. (25) From trainee art education students, (25) from trainee physical education students, and (22) from trainee special education students.

Tool:

The researchers used The Trainee Students Attitudes to Inclusion Scale to measure student teachers' attitudes to include students with disabilities in general classes designed by the researchers. In order to ensure the validity and reliability of the scale form, it distributed to four instructors who had completed their doctorates and this form developed in according the opinions of the instructors, then a pilot study were conducted and the value of reliability was found. It was about (0.80) and after that, the scale forms became ready for application.

Practical Procedures:

After the researchers preparing the questionnaire and selected the sample. The researchers administered the questionnaire. The respondents were allowed a period of 21 days. After that, the researchers went round to collect the questionnaire items for analysis. The data collected was analysed using independent samples test.

Results:

After analysing the data, the results are as follows:

Question one: What is influence of disabilities acceptance on attitude of trainee students toward inclusive?

For answer this question the researchers used independent samples test technic. Table 1 shows the result.

Table 1 shows the differences on attitude of trainee education students toward inclusion according to disabilities acceptance.

Disabilities acceptance	Number	Mean	Std. Deviation	T value	Sig.	Result
Yes	62	132	10.47	5.196	0.02	significant
No	20	109	12.50			

When we compare between students whose acceptance disabilities with whom not acceptance disabilities we found the mean of acceptance students (132) is greater than non-acceptance students (109) and the value of Sig (0.02) is lower than significant level (0.05), this means there are differences on attitude of trainee education students toward inclusion according to disabilities acceptance, and acceptance Trainee students have positive attitude.

Question two: What is influence of knowledge about inclusive and disability on attitude of trainee students toward inclusive?

For answer, a question the researchers used independent samples test, table 2 shows the result.

Table 2 shows the differences on attitude of trainee education students toward inclusion according to knowledge about inclusion and disability.

knowledge about inclusion	Number	Mean	Std. Deviation	T value	Sig.	Result
Yes	60	110	12.47	2.196	0.01	significant
No	22	107	13.50			

When we compare between students whom have knowledge about inclusion and disability with whom not have not knowledge about inclusion and disability, **we found the mean of have knowledge** about inclusion and disability (110) is greater than not have knowledge about inclusion and disability (107), and the value of Sig (0.01) is lower than significant level (0.05), this means there are differences on attitude of trainee education students toward inclusion according to knowledge about inclusion and disability, and have knowledge about inclusion and disability trainee students had positive attitude.

Question three: What is influence interaction with disabilities on attitude of trainee students toward inclusive?

For answer, a question the researchers used independent samples test, table 3 shows the result.

Table 3 shows the differences on attitude of trainee education students toward inclusion according to interaction with disabilities.

Interaction with disabilities children	Number	Mean	Std. Deviation	T value	Sig.	Result
Yes	64	110	11.62	2.133	0.01	significant
No	18	108	19.34			

When we compare between students whom interaction with disabilities with whom not interaction with disabilities, we found the mean of interaction with disabilities (110) is greater than not interaction with disabilities (108) and the value of Sig (0.01) is lower than significant level (0.05), this means there are differences on attitude of trainee education students toward inclusion according to interaction with disabilities, interaction with disabilities trainee students had positive attitude.

Discussion

The study revealed that:

Disabilities acceptance influenced on attitude of trainee students toward inclusion. This result is in line with many studies. A study conducted by Malak (2013) indicated that considerable variances among the attitudes of the trainee students had close contacts and trainee students did not. To clarify, participants interacted with individuals with disabilities revealed more positive attitudes than those without who did not. Ajuwon, & et al (2012) indicate that trainee students highly had experiences with students with special needs revealed more positive attitudes than those who did not. Taylor, & Ringlaben (2012), indicated that participants revealed that acceptance of diversities by typical pupils would be promoted by educating people with disabilities in general classes. Researchers indicated that trainee students' attitudes were positively influenced after taking the preparation program, and students' attitudes, self- efficacy and confidence would be enhanced by providing the students training courses about inclusive education. In addition, levels of training courses can influence trainee students' attitudes toward inclusive education. Pedersen, Cooley, & Hernandez (2014), found that college students had more time to train had positive beliefs, attitudes, and intentions toward inclusive education than their counterparts had less training time, but researchers indicated that variances among students' responses were based on university attended. The researchers pointed that inclusive education can be successful if teachers are acceptance disabilities. In addition, researchers indicated that it is important to examine the attitudes of mainstream educators toward the inclusion of students with disabilities into regular settings as their perceptions may influence their behavior toward and acceptance of such students.

In addition, the study revealed that knowledge about inclusive and disabilities influenced on attitude of trainee students toward inclusion. This result is in line with study conducted by Thaver & Liau (2014) which indicated that trainee educators had more previous training to educate people with disabilities in inclusive settings obviously revealed higher positive attitudes to educate children with special needs in general classes than trainee educators did not have. Sharma & Desai (2012) found that participants who had training courses in special education were more confident to educate individuals with special needs in general classes too.

In addition the study indicated that training influenced positively participants' attitudes improved their confidence to educate children with special needs in general classes. Cameron, & Cook (2007) told that special education teachers' attitudes pertaining planning and accommodations, educational qualifications, program of study, training in special needs and contact with disability to educate people had intellectual disabilities were more positive than attitudes of future general teachers. Malak (2013) told that considerable variances among the attitudes of the trainees had field training in inclusive settings and trainees did not. To clarify, participants had field training in inclusive settings revealed more positive attitudes than those without training. Ajuwon, & et al (2012) indicated that trainees' attitudes towards inclusive education were pointedly enhanced after teaching an introductory course in special education to all trainee students. Mangope, Mannathoko, & Kuyini (2013) found that there were some factors influenced trainees' attitudes such as their background, age and gender. Furthermore, researchers indicated that training was related to more positive attitudes to include individuals with disabilities: researchers attributed college students' concerns to include students with disabilities to some external factors such as insufficient knowledge and skills to well educate individuals with disabilities as well. Likewise, researchers found that trainee students revealed insufficient

knowledge and skills for including individuals with disabilities and indicated that trainee students revealed that they needed more knowledge and skills to facilitate learning among all of the students.

Similarly, researchers found that trainee students revealed that they needed more knowledge and skills to change settings to facilitate Physical Education for individuals with disabilities. Finally, researchers found that trainee students disbelieved that they had been trained sufficiently to make instructional adaptations. Loreman, Sharma, & Forlin (2013) indicates that there were statistical differences among trainee students had no or low experience, confidence, preparation or knowledge in an area, and students revealed better responses. In general, trainees, who held lower levels of knowledge and awareness, experience, confidence or preparation, revealed lower attitudes of teaching self-efficacy to include pupils with disabilities. Additionally, trainee students' attitudes toward applying inclusive education can be influenced by modifying a method that can be educationally useful to make accommodations to teach children with severe disabilities in general classrooms. Campbell, Gilmore & Cuskelly (2003), the results showed that knowing more about significance of disabilities might guide to changes in attitudes and dispositions towards disability in general. The researchers pointed that knowledge about inclusion and disability is very important for teachers whom work with special needs and it so difficult to work with them without knowledge about inclusion.

Finally, the finding indicated that interaction with disabilities influence on attitude of trainee students toward inclusion. This result is in line with study conducted by Thaver & Liau (2014) which revealed that interaction with individuals with special needs and previous training in disabilities significantly influence attitudes. Thaver & Liau (2014) revealed that interaction with individuals with special needs and previous training in disabilities significantly influence attitudes. In addition, researchers indicated that trainee students had more interactions and contacts with people with disabilities obviously revealed higher positive attitudes to educate children with special needs in general classes than trainees did not have. Ajuwon, & et al (2012) exposed that trainee students highly held confidence to educate people with special needs revealed more positive attitudes than those who did not.

Likewise, they indicate that trainee students highly interacted with students with special needs revealed more positive attitudes than those who did not. Campbell, Gilmore & Cuskelly (2003), showed that, trainees presented affirmative dispositions towards including pupils with Down syndrome, and when interacting with people with disabilities, trainees' attitudes towards disability in general improved to the acceptance of the differences. Sharmaa Moorea, & Sonawaneb (2009), indicated that interactions with children with disabilities would positively influence trainee' attitudes and might considerably decrease concerns and worries to educate children with special needs in inclusive classes.

Finally, the researchers pointed that interactions and contacts with people with disabilities is very necessary when you need to educate children with special needs in general classes.

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Perceptions Of Undergraduate Students Of University Of Ilorin On The Causes Of Domestic Violence Against Women

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Abstract

This study investigated the perceptions of undergraduate students of the University of Ilorin on the causes of domestic violence against women. A total of 200 students comprised of 114 males and 86 females from two faculties (Humanities and Sciences) of the University of Ilorin were sampled. The t-test and analysis of variance statistics were adopted to compare the perception of the undergraduate students by faculty, sex, religion and marital status @ 0.05 level of significance. Questionnaire was used to collect data from the respondents. The findings of the results indicates there was no significance differences in the causes of domestic violence against women as perceived by male and female undergraduate students; different religious affiliations; humanity and Science faculty as well as married and single undergraduate students of university of Ilorin. Also, the findings indicated that domestic violence against women is being caused by disobedience on the part of the wife, jealousy, drug usage, poor home background, lack of proper guidance, uncontrolled sexual desire, consumption of alcoholic drinks, marital incompatibility, forced marriage and so on. The following recommendations were made: that there should be researches on this widen topic to enable have horizon knowledge of domestic violence against women, it should involve all parts of the country to make generalizations possible for the Nigerians. Awareness should be raised to prevent domestic violence against women by all and sundry. Parents should create time to show love to their wards to make home less burdensome and violent among others.

Keywords: Perception, Rape, Sexual Harassment, Violence, Wife battering

Introduction

Violence against women in Nigeria is gradually assuming a high dimension. Psychologists, counselors and social workers are greatly concerned about this problem and several questions have been raised as to the reason for domestic violence against women. The high rate of violence has generated an interest in exploring the potentiality of non-violence and non-violent techniques in reducing violence in human society. At the physical level, violence entails a high degree in terms of destruction of life and property with their attendant hatred and malevolence. At the psychological level, violence and crime have led to the destruction of people's psychic resistance emotion of stability and other personality qualities. Violence and crime have therefore become important social issues both at national and domestic levels and have formed the subject of researches, conferences and seminars. Reputable scholars as far back as the 1950s, such as Coser (1959), Gregg (1966), and Ardrey (1966) have conducted studies on violence. In this regard, therefore, discussion on violence against women in general, and in Nigeria in particular, appears necessary, such discussions are useful because of the crucial role of women in contributing effectively and efficiency to national development. An understanding of the African cultural perspectives of violence against women appears equally necessary because such knowledge may be useful in determining the limit of violence within a cultural environment. On this, depends the

understanding, control and prevention of violence against the female folk particularly in the Nigerian environment.

Women are crucial to the growth and development of any nation and the world in general. In their multiple roles as mothers, educators, food gatherers, health cleaners, inter-generational links, transmitters of values and emotional anchor as they have always carried the major burden of the family (Davies 1989). Women are sometimes the family breadwinners and they work outside the home to support their families. Also, women give compassion to family members, and they provide health care for the family members. The United Nations (1975) report indicated that women in Africa supply seventy percent in animal husbandry and sixty percent in marketing. The report noted that women constitute half of the world's population and they are homemakers and custodian of social, cultural and fundamental values of the society and permanent change is often best achieved through them. According to the United Nations (1978) reports, full community development is impossible without their (women) understanding, co-operation an effective participation. Women occupy an essential position in the life of any nation but they are subjected to different forms of domestic violence which seems to hinder their effective contributions to the national development.

Some of various forms of violence which have been identified are wife battering, rape, acid attack, female circumcision and sexual harassment. These attacks on women affect their physical and psychological wellbeing and as such they seem to be eroding the position of women both at home and in the society at large. Domestic violence against women therefore deserves to be studied in order to provide possible solution. The most serious and powerful aspect of domestic violence against women are some cultural practices which put women behind the men some of the traditional practices degrade women and subject them to all forms of manipulations. There is also the problem of ignorance of individual right, which has kept people away from discussing the problem of domestic violence against women. Considering the importance of women as mothers, breadwinners, teachers, guardians and teachers they deserve respect, recognition and better treatment but the opposite is usually the case. Women are enslaved in a circle of poverty and they suffer from neglect, discrimination and exploitation. They are also subjected to different forms of violence by their male counterparts (Davies 1989).

Adeoye (1996) defined violence as the use of coercive or subtle pressure and unrestrained action in the pursuance of an objective. He noted that the Nigerian newspapers are replete with news of violence on the highways, in private home, in offices and even in church and mosques. The various forms of violence against women include wife battering, denial of self-expression, female child-labour, childhood marriage, female genital mutilation, exploitation, violence by law enforcement agents, negative cultural attitudes and degrading traditional practices e.g. widowhood rites and nutritional taboos and denial of female education. Of these various form of violence, the researcher is interested in examining the causes of domestic violence against women with particular reference to wife battering, rape and sexual harassment which are the most rampant forms of domestic violence against women. Rape is an unlawful carnal knowledge of a woman or girls without her consent or by force or with consent by means of threats or intimidation of any kind, by fear of harm or false and fraudulent representation (Essen, 1989). Thompson (1974) also described rape as any intimacy forced on one person by another. Rape is most commonly understood to mean forcing a woman to have sex against her wishes by using physical or psychological force, threats of force, drugs, deception, or any combination of these. Rape is a serious crime punishable by law up to thirty years imprisonment in some states and death penalties in others. According to Essen (1989), rape is one of the violent crimes which subject its victims to physical, emotional and psychological trauma.

Another major violence against women is wife battering. Wife battering is an exposure of an individual (e.g. a married woman) to a serious beating or repeated injury (Scott 1974). Rounsaville (1976) described a battered wife as a woman whose intimate sexual partner has used violence and physical force upon. Field and Field (1973) observed that there is an official acceptance of violence between "consenting" adults, and that people perceive domestic violence as a private affair. The American National Commission on the causes and

prevention of crime or violence found in large representative samples that between one-fourth and one-fifth of the adults questioned felt that it was acceptable for spouse to hit each other under certain circumstances (Stark d, Mc Envy, 1970). Victims of wife battering are reported to suffer from physical and psychological pains.

Domestic violence against women constitutes a great problem of the family and the society at large. In recent years, there seems to be a great upsurge of rape, wife battering and sexual harassment. Domestic violence against women occurs at home, in public like street, parks, familiar places like home of friends and relatives, offices involving highly placed executive and also in churches. The offenders are either adolescent males or adult males or someone in position of authority. Stranratz and Gelles (1980) explained that both husband and wife engage in act of violence but the husbands' rate was higher and far more harmful form of violence, such a battering, and the use of knives or guns. Domestic violence against women has deep root in many cultures and religion and supported even institutionalized by patriarchal values in most societies. Public responses to acts of violence range from pride to denial or tacit conceit or wife battering may happen in thirty percent of families but not recognized in the public eyes (Davies 1987). Violence is a global problem that can no longer be ignored or permitted to remain hidden (Davies 1989). Women and young girls too perpetuate violence by remaining silent, excusing violence, blaming themselves and accepting cultural and rationalized.

Domestic violence however also includes psychological or mental violence consisting of constant verbal insults, harassment, denouncement by spouses of one another, confinement, and child abuse or neglect etc. some issues that give rise in Kano to wife battering, a prominent feature of domestic violence, have been partly elucidated in our earlier discussions. Domestic violence is one of the most difficult problems to investigate in the field of urban violence as it is a hidden problem. Women get openly beaten by their spouses. In some cases, the half-naked woman has to be chased all about with firewood, horse whip etc. yet, researchers; who want to study this type of thing have to wait to witness one themselves; otherwise no woman will tell them she was beaten. Women hardly confess that they are assaulted by their spouses since such matters are supposed to be a private problem of the concerned couples. Police records could contain data on assaults. The nature of such assaults are not usually stated, neither do the records indicate the sex of the victims of assault.

In view of the negative influences of violence on physical and psychological wellbeing of womanhood, this study investigated the causes of domestic violence against women as perceived by undergraduate students of University of Ilorin. The study is based on the assumptions that once people are aware of the causes of the problem and its effects, the problem is also solved.

Purpose of the Study

The main purpose of this study is to investigate the causes of domestic violence against women as perceived by the undergraduate students of University of Ilorin. Specifically the purpose of the study is to investigate whether:

1. The male and female undergraduate students are significantly different in their perception of the causes of domestic violence against women.
2. Undergraduate students of different religion affiliations (Christianity, Islam and others) are significantly different in their perception of the causes of domestic violence against women.
3. Undergraduate students from humanities and science faculties are significantly different in their perception of the causes of domestic violence against women.
4. Married and single undergraduate students are significantly different in their perception of the causes of domestic violence against women.

Research Questions

The following research questions are raised to guide the conduct of the study:

1. What are the causes of domestic violence against women as perceived by the undergraduate students of University of Ilorin?
2. Is there a significant difference in the causes of domestic violence against women as perceived by male and female undergraduate students of University of Ilorin?
3. Is there a significant difference in the perception of the cause of domestic violence against women as perceived by the undergraduate students of different religious affiliations?
4. Is there a significant difference in the causes of domestic violence against women as perceived by undergraduate students from humanity and science faculties of the University of Ilorin?
5. Is there a significant difference in the causes of domestic violence against women as perceived by married and single undergraduate students of University of Ilorin?

Research Hypothesis

The following hypotheses were formulated based on the research questions.
The hypotheses are:

1. There is no significant difference in the causes of domestic violence against women as perceived by male and female undergraduate students of University of Ilorin.
2. There is no significant difference in the causes of domestic violence against women as perceived by the undergraduate students of different religious affiliations?
3. There is no significant difference in the causes of domestic violence against women as perceived by undergraduate students from humanity and science faculties of the University of Ilorin?
4. There is no significant difference in the causes of domestic violence against women as perceived by married and single undergraduate students of University of Ilorin?

Scope of the Study

The focus of this study is to investigate the causes of domestic violence against women as perceived by undergraduate students from the eight faculties in the University of Ilorin. The choice of undergraduate students is based on the fact that they constitute the future leaders (mothers or fathers) of tomorrow who require adequate knowledge on violence against women.

Methodology

The research design adopted for this study was the descriptive survey method. According to Kerlinger (1973), survey research method is considered adequate, because it focuses on people and their beliefs, opinions, attitudes, perceptions, motivation and behaviours. Two hundred students were selected from the population of University students. This comprises 100 students from humanity and 100 students from sciences. The department of Linguistics, Religions, English Language and History and International Studies were purposefully selected to represent humanities while department of Statistics, Biochemistry, Microbiology and Industrial Chemistry were selected to represent Sciences. Thus, twenty five students were purposefully selected from each of the departments listed where to obtain from each of the required two hundred respondents. The researcher ensured that the questionnaires were given to students of different sex, religions and marital status to take care of the different variables of interest. The instrument used for the collection of data for this study was a questionnaire. The questionnaire was designed personally by the researcher and named causes of domestic violence against women questionnaire (CDVAWQ).The instrument consists of two parts the first part requires the respondent to give personal information such as sex, class levels, age, faculty, marital status and religion

affiliations The second part is meant to collect information on causes of domestic violence against women.

To ascertain the validity of the instrument, the instrument (CDVAWQ) was given to experts in the departments of Sociology and Counsellor Education, University of Ilorin for validation. Reliability is defined as the consistency of test scores when it is administered in number of times. In establishing the reliability instrument, a pre-test method was adopted with an interval of four weeks, using the Pearson Product Moment of Correlation Co-efficient, a reliability index of 0.79 was obtained indicating strong reliability of the instrument. The questionnaire is made up of statement on a 4 point likert scale and the respondents are to respond by ticking ( ) any of the items based on their agreement and disagreement with the statements. For example SA (Strongly Agree) = 4, A (Agree) = 3, D (Disagree) = 2, SD (Strongly Disagree) = 1. The hypotheses generated were tested using t-test statistics.

Results

Testing of Hypotheses

The main purpose of this study was to investigate the causes of domestic violence against women as perceived by undergraduate students of University of Ilorin. Hence four hypotheses were used and tested with the use of T-test and Anova.

Hypothesis One: *There is no significance difference in the causes of domestic violence against women as perceived by male and female undergraduate students of University of Ilorin.*

Table 1: Means, standard deviations and t-test of male and female undergraduate students perception of causes of domestic violence against women

Sex	No of cases	X	SD	df	Cal t- value	Critical t-value
Male	114	62.1140	6.082	198	.69	1.96
Female	86	61.5000	6.378			

NB: NS= Not significant p>0.05

Table 1 presents the results of t-test analysis on the undergraduate students' perception of cause of domestic violence against women. The results show a calculated t-value of .96. Since the calculated t-value (.69) is less than the critical t-value (1.96), the null hypothesis which states that there is no significant difference in the causes of domestic violence against women as perceived by male and female undergraduate students of University of Ilorin is accepted.

Hypothesis Two: *There is no significance difference in the causes of domestic violence against women as perceived by undergraduate students from humanity and science faculties of University of Ilorin.*

Table 2: Means, standard deviations and t-test value for undergraduate students of humanities and science on their perceptions of causes of domestic violence against women

Group	No of cases	X	SD	df	Cal t- value	Critical t-value
Humanity	114	1.5175	.502	198	1.39	1.96
Science	86	1.4186	.496			

NB: NS= Not significant p>0.05

The result on table 2 is on the causes of domestic violence against women. It indicated that the calculated t-value of 1.39, while the critical t-value (1.96). Since the critical t-value is greater than the calculated t-value, the null hypothesis is therefore accepted. This means that there is no significant difference in the causes of domestic violence against women as perceived by undergraduate students from Humanity and Science faculties of University of Ilorin.

Hypothesis Three: *There is no significance difference in the causes of domestic violence against women as perceived by married and single undergraduate students of University of Ilorin.*

Table 3: Means, standard deviations and t-test value for married and single undergraduate students on their perceptions of causes of domestic violence against women.

Group	No of cases	X	SD	df	Cal t- value	Critical t-value
Married	114	1.3070	.463	198	.61	1.96
Single	86	1.2674	.445			

NB: NS= Not significant p>0.05

Table 3 indicates that the calculated t-value is .61, and the critical t-value is 1.96. Since the critical t-value is greater than the calculated t-value, consequently the null hypothesis which states that there is no significant difference in the causes of domestic violence against women as perceived by married and single undergraduate students of University of Ilorin is accepted.

Hypothesis Four: *There is no significance difference in the causes of domestic violence against women as perceived undergraduate students of different religious affiliation.*

Table 4: Analysis of variance (ANOVA) Comparing undergraduate students of different religious affiliation perceptions of causes of domestic violence against women.

Sources of variation	Sum of square	df	Ms	Calculated f-value	Critical value
Between sample	10.5636	2	5.2818	.1361	3.0
Within sample	7644.9364	197	38.8068		
Total	**7655.5000**	**199**			

NB: NS= Not significant p>0.05

Table 4 presents the result of analysis of variance of undergraduate students of different religious affiliations perception of the causes of domestic violence against women. The result shows an F-value of .1361, and the critical f-value is 1.96. Since the calculated f-value is lesser than the critical F-value, the null hypothesis four which states that there is no significant difference in the causes of domestic violence against women as perceived by undergraduate students of different religious affiliation of University of Ilorin is accepted.

Discussion

The findings of the study were based on the distribution of respondents by faculty, sex, religion and marital status. From the distribution of respondents by sex, the proportion of female who responded to the questionnaire was 43% while that of male was 57%, the percentage of students from humanities equals 52.5% and that of science 47.5%. The distribution of the respondents by religion indicates that Islam religion records 40.5% while Christianity has 51.3% and other religion has the remaining 8.5%. The distribution of respondents by their marital status indicates that the married undergraduate students constitute 29% of the respondents while single students are 71%.

The first hypothesis states that there is no significant difference in the causes of domestic violence against women as perceived by male and female undergraduate students of university of Ilorin. The hypothesis was accepted. This indicates that both male and female undergraduate perceived the causes of domestic violence against women in a similar manner. This may be as result of living together in the same environment or sharing the same similar attitude and beliefs.

The second hypothesis states that there is no significant difference in the causes of domestic violence against women as perceived by undergraduate students from humanity and science faculties of University of Ilorin. This hypothesis was accepted on the basis of the findings of this study. This means that there was no significant difference in the perception of the causes of domestic violence against women as perceived by both male and female in the faculties of science and humanity. Both groups viewed the problem in a similar way.

The third hypothesis states that there is no significant difference in the causes of domestic violence against women as perceived by married and single undergraduate students of University of Ilorin. The hypothesis was also accepted. This means that both the single and married undergraduate students view the causes of domestic violence against women in a similar manner. This finding may be due to the enlightenment and interpersonal relationship among the respondents.

The fourth hypothesis states that there is no significant difference in the causes of domestic violence against women as perceived by undergraduate students of different religious affiliations. This hypothesis was also accepted on the basis that they view the causes of domestic violence against women in a similar way and may as well be due to the enlightenment and interpersonal relationship among the respondents.

The descriptive data tables revealed that domestic violence against women is caused by traditional or cultural beliefs. This was expressed by 109 (54.5%) of the respondents. This indicates that traditional or cultural beliefs cause domestic violence against women. In most African countries people believed that men are more valuable and superior to women and as such they are given more opportunities than women. Women are expected to accept male domination and control without questioning. The finding also shows that domestic violence against women was perceived to have been caused by improper view of sex. This view was supported by 114 (57%) of the respondents.

Consumption of alcoholic drinks, forced marriage, involvement in extra-marital affairs, the desire of men to dominate women, availability of violent video programmes and exposure of children to violent actions at home, uncontrolled sexual desire, disagreement in sexual matters, disobedience on the part of any of the spouses, disagreement on mode of disciplining the children were among the factors identified as one of the causes of domestic violence against women.

Conclusion

The study therefore concluded that difference in sex of undergraduate students does not influence their perception of the causes of domestic violence against women; the beliefs and practices of undergraduate students do not influence their perception of the causes of domestic violence against women difference in marital status of undergraduate students does not influence their perception of the causes of domestic violence against women; the difference in the faculties of undergraduate students of University of Ilorin does not influence their perception of the causes of domestic violence against women.

Recommendations

Based on the findings of this study, the following recommendations were made.

1. Domestic violence can be reduced to the lowest minimum by proper training from the very early days of the child, even before the nursery school age.
2. The home can be organized in such a manner that the child-rearing practices are geared toward attempting to interest a child in constructive and peaceful activities.
3. There should be an improved mass media: In Nigeria, especially the video cassettes and films of various kinds have brought into our homes series of violence where guns are freely used.
4. There should be campaigns by members of the community and governmental agencies on domestic violence against women. For instance, social welfare agencies should be established to prevent sexual abuse and all other forms of domestic violence against women.
5. Parents should create time to show love in their various homes, interact and listen to their wards to make home less burdensome and violent.
6. Attention should be directed to educate the masses for a change of behaviour. They should develop positive attitude towards their fellow human beings as this will minimize the issue of ritual practices and acid attack.
7. There should be seminar or conferences for women to make them aware of some causes of violence such as wearing of provocative dresses, disobedience and other forms of bad behaviour.
8. There should be enlightenment campaigns in the world at large on the effects of domestic violence against women to prevent them from indulging in such actions. Those who violated women's rights should be publicized to serve as deterrent to others.
9. There should also be an improved education system.

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Study of Organizational Image as Competitive Differential for the Institution of Higher Education

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Abstract

This article presents the results of a satisfaction survey carried out with a College located in Ponte Nova/MG-Brazil. The research in question, aimed to verify what are the factors that affect the formation of the image of a school of higher education, the perception of your target audience. Among the multivariate techniques used in this paper we can highlight the principal component analysis (PCA) and factor analysis (FA) aimed mainly to reduce a large amount of data to a smaller set, to convey as much information possible. The results achieved through the analysis of the variables obtained by the survey, can serve as a basis for establishing improvement targets for forming the image of an institution of higher education, because they represent the views of the main public that establishment.

1. Introduction

Requirements, increasing, consumers have demanded an effort to adapt and update by business. No matter what industry specifically, but it is noteworthy both their commitment to better manage their assets and resources in an attempt to preserve the market and win new customers.

One of the sectors that has been subjected to this pressure is the education. This level of demand and market potential still favoring schools, however, the benchmarks of quality of higher education institutions through the results of assessments carried out by the Ministry of Education - about the faculty level, the prestige of institution or the available infrastructure, for example - already clearly set out the factors that differentiate this sector. Thus offer products and services (courses) quality became, first of all, a condition for the survival and growth of these organizations.

To face this reality and consolidate its actions in this market segment, educational institutions need to keep up with innovations, adapt to change and seek improvements in the services provided to their students and the communities they serve. To measure, analyze and evaluate their actions and customer satisfaction, the institution must be attentive to their image and what is on positioning and market share.

By making a retrospect, it is clear that since the 50s, scholars express concern in conceptualizing the term "image" and define what their role in organizations. By way of confirming said, Boulding ensures that:

> [...] Individual knowledge is the collection of images that the person has a body that it has had contact during his lifetime. Thus, the image that one has of an organization or a product or brand influences their behavior. (Boulding, 1956, p.06)

The term "image" is now used by several American companies being used in different contexts, being initially linked to the products and brands and, subsequently, more broadly, organizations and marketing. The importance of using imaging studies to support the strategies is due to the fact that the products resemble more and more, thus preventing that universities maintain a differential for long.

Given the above and considering that students play an important role in shaping the image of an institution of higher education, it was intended to seek answers to the question: what are the variables interfere in forming the image of a school of higher education, according to perception of your students?

To this end, we carried out a survey of students Administration course a university located in Nova Ponte / MG, whose objectives were: to identify the compliance of the curriculum to the needs perceived by the students, find out the expectations of this group in discharge of their teachers, detect prospects, students, compared to skills development and engagement in the labor market and verify that the reputation of the institution can be one of the relevant factors in relation to the organization's image formation in question .

It is believed that the knowledge of the results of this research is of utmost importance both for the institution concerned, as for other educational institutions, since the need to check on the image, it becomes a competitive advantage.

Since this is an exploratory character study, the results were statistically analyzed descriptively by checking the relationship between the nine key variables (Business Conduct, social conduct of the company, Services, Communication, Support, distribution channels, product, sales force and Price) in the locus of study.

The research came from the following assumptions: the student of today, due to the economic conditioning, is visibly worried about their insertion in the labor market and the school's image that frequent, so, higher education institutions must adapt its structures to these new requirements so that they can survive in an increasingly competitive space.

2 Definitions Of The Term Image And Its Relevance To The Higher Education Institutions

There are several picture settings, because its meaning is linked to the areas or sub-areas of knowledge such as semiotics, communication, philosophy, theology, economics and marketing. Based on the review of the different ways of conceptualizing image, drawn up by authors like Kotler and Fox (1994), Kazoleas, Kim and Moffitt (2001), identifies that your concept in a marketing perspective, can be summarized as: representations, impressions, beliefs and networks of meanings of an object, product, service, brand, organization or store, stored in consumer holistically memory, which is formed through sensory, cognitive, functional and emotional.

From the perspective of Schuler (2003), the image is able to influence and direct the behavior of people, so, check that the image can convey to the consumer public, is an important ally for strategic management of organizations. "The image is the result of a complex process in which the organization sends a message to your audience through social, historical, personal experiences and material factors" (Kazoleas et al., 2001, p.04).

It is noticed that the image is formed by a set of tangible and intangible factors that man perceives the environment where they live, thus, a higher education institution is assessed for its infrastructure, quality of education, competence of its faculty, staff , laboratories, location and reputation, among other things.

Barich et al. (1991) states that under a marketing perspective, the image involves: the brand image; image of the products; marketing image and corporate image. In the context of research in question, the study focus was on the corporate image which, according to Melo and Vieira (2004, p.01), "is the impressions and opinions about a recent firm, summarizing a set of complex meanings that influence behavior and decision making "- public perception of the company.

Regarding the education sector, it is clear that today there is a greater zeal in relation to the image, because with Colleges and Universities numerous proliferating across the country, competition becomes fierce, and some

features, such as positioning before employees and the conduct in relation to the company, may be the differences that ensure the permanence and credibility of the institution in the market.
Universities and Colleges that a few years ago, acted passively in educational issues, especially in relations with the market today are being forced to be pro active in their strategic actions, especially in identifying and meeting the expectations and needs of a selective and demanding market (Vergara, 2007).
According to Franco (1998), a school that goes beyond the boundaries of materiality has the key role to develop habits, customs and attitudes centered on commitment and social responsibility, and provide general, specialized and scientific knowledge. Educational institutions can not be limited simply to be providers of knowledge ..

2.1 Variables That Influence The Image Of Formulation

Based on studies of Figueiredo and Lara (2003), the factors were selected that are considered essential to the formulation of the image of a company, in this case, a higher education institution.
In order to not be limited to describe the factors that contribute to the design image in the selected public view, the coordinates that will guide the image study will have as support the design of Figueiredo and Lara (2003), shown in Figure 01 .

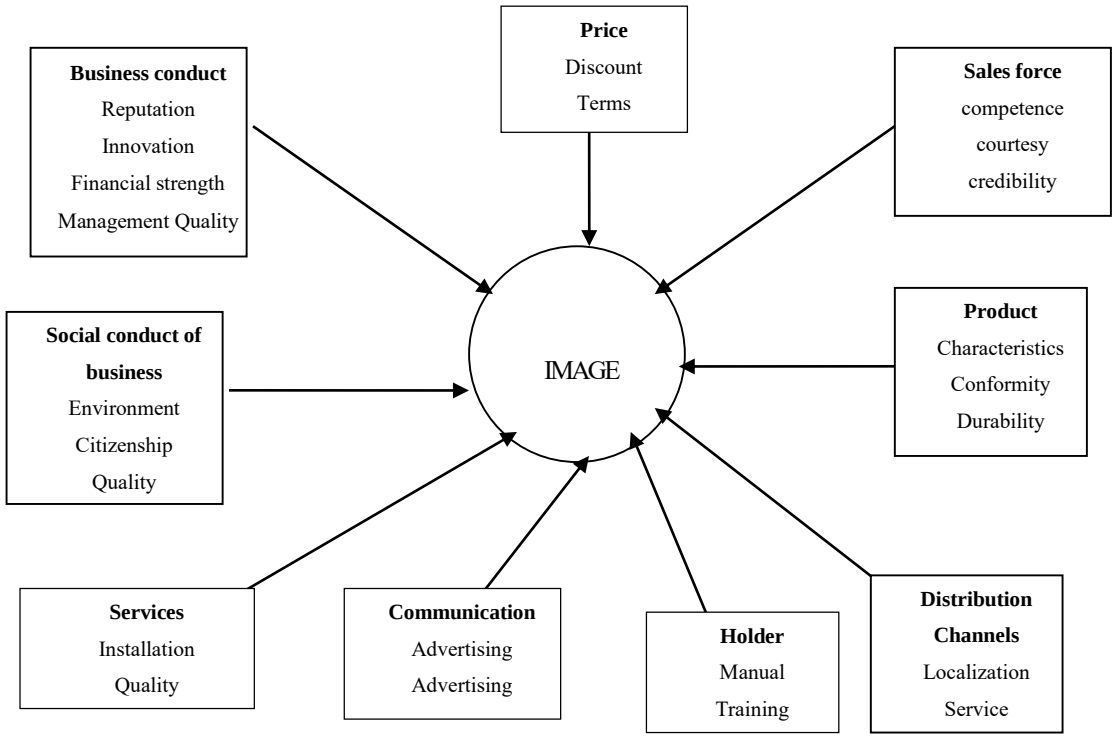

Figure 01 - Main variables for the formulation of an image Source: "The importance of the image in the local strategy: a study in the city of Belo Horizonte," Figueiredo and Lara, 2003 - (Adapted by the author)

3 Methodology

This research aims to study, analyze and obtain information regarding the undergraduate degree in Business Administration from a higher education institution in the state of Minas Gerais, making use of descriptive and exploratory research the most appropriate for considering them in preparation of this study.

Since this is a study that focuses on the image of a University in the target audience design, the use of descriptive research was the most appropriate, considering that this type of research notes, records, analyzes and correlates events or phenomena (variables) without manipulating them.
Regarding the use of exploratory research, it took into account the fact that it seek to understand the reasons and motivations implied for certain attitudes and behavior of people.
To conduct the survey used a questionnaire applied on equal terms to all respondents.
The questionnaire, in question, was in two stages. The first part was intended to seek information about the interviewee: period and that shift is attending, gender, age, data on its previous intellectual training, work and family income.
The second part brought questions concerning vocational training higher education in general, and encompass ask concerning the assessment / opinion of the student and the degree course in Business Administration and about their own educational institution in question. In this part, only in relation to the first question, it was decided to dichotomous alternatives, considering that the binomial (YES, NO) would not cause prejudice to the reliability of the data. But in other issues we opted for the use of Likert scale, the fact that it is based on the premise that the general attitude is referred to beliefs about the object attitude, the force that holds these beliefs and values linked to the subject. It points out that data collection has enabled a broad overview of the University's image in the study, as were interviewed all the students enrolled in the last two periods of the course of Directors of the institution, making a total of 55 students. Information on some aspects related to the undergraduate course in administration and were collected from the tabulation of questionnaires and analyzing the results, were raised inferences to the whole.
The sampling process of this research was used the non-probabilistic technique intentional, since it wished to obtain the views of customers on the undergraduate course in administration, ie information of a group in a specific context.
Made data collection, they were tabulated and subsequently analyzed. For such analysis techniques were adopted specific statistics according to the type of the data. , Is worked in the first phase, with descriptive statistics, ie statistical tools to describe and present data because it was necessary to outline and see what happened to the data, as well as the divergent and isolation of variables key.
Later we used two techniques of multivariate data analysis: the principal component analysis and factor analysis, and rotation factors used in conjunction with the latter. Multivariate analysis was used to be a set of statistical methods used to study a large number of variables measured simultaneously and correlated in general.
According to Hair, Tatham, Anderson and Black (2005, p.91): "The main advantage of multivariate techniques is its ability to accommodate multiple variables in an attempt to understand the complex relationships not possible with univariate methods." Among the main objectives of this form of analysis are: the classification or grouping; the reduction or simplification data; checking of dependence between variables; and prediction and hypothesis testing.

3.1 Description Of The Technical Analysis Of Multivariate

Initially, the principal component analysis (PCA) was used, since the goal is to play a lot of multivariate and correlated data.
The ACP, including all the variables, can also be understood as a factor analysis (FA) with all the variables. We analyzed the correlation of the variables in the structure of ACP and then made to an AF for a description of the data.

3.1.1 Principal component analysis

In an ACP intended to analyze the structure of a set of correlated variables, to be lowered to a new set of uncorrelated variables and quite inferior to the original number. These new variables are called principal components (PC), and are constructed using linear combinations of the original variables uncorrelated. CP are uncorrelated linear combinations of the original variables and are estimated from the structure of variance and covariance of these observed variables (covariance matrix).

3.1.2 Factor analysis

The multivariate technique of factor analysis is intended to summarize the information from a data set to a set of factors, and such an AF analyzes the structure of interrelations (correlations) variables. As are many variables jointly analyzed works is always with arrays, and the data correlation matrix denoted "R".
Such factors are present in much smaller amount than that of observed variables, thus enabling a better organization and interpretation of data by the researcher.
A factor analysis can be summed up in a few steps of paramount importance: check the adequacy of the AF data; determination of extraction technique and quantity of factors to be extracted; Factor rotation; and analysis of specific factors.
To check the adequacy of the data, certain criteria were adopted: the first provides that the ratio between the number of cases and the number of variables must be greater than 5. According Tan (2008, p.323), "for studies involving factor analysis [...] the minimum number of respondents must be equivalent to 5 times the questionnaire number of assertions and the ideal number is 10 times. " The second criterion determines that the correlation between the same variables should be in the majority, greater than 0.30.
Also, to verify the suitability of the AF data, two tests are necessary: the Kaiser-Meyer-Olklin test (KMO) and Bartlett sphericity test (BTS). The KMO is an integer ranging between 0 and 1, with the best fit close to the value 1. Hair et al. (2006) suggests the cutoff point of 0.5 for the adjustment setting. Has the following adjustment range to a AF in mathematical notation: [0, 0.50) inappropriate, [0.50; 0.60) bad [0.60; 0.70) mediocre, [0, 70, 0.80) Median [0.80; 0.90) and good [0.90, 1.00] excellent. The BTS should be significant (p-value <0.05).
Most of the time the full set of observed variables not enter the AF. The extraction technique of the factors depends on the purpose of the researcher. So we worked with major components, after all, the goal is to summarize the original information.

To determine the number of factors has been used a method of Kaiser and the percentage of variance explained accumulated. The Kaiser Criteria, or self-worth of the rule suggests that only factors with eigenvalues greater than 1 are to be extracted. According to Hair et al. (2005, p.90): "eigenvalue [...] also known as latent root [...] is the amount of variance explained by a factor". The criterion of accumulated variance shows the total percentage that such factors explain together the total variance of the observed data. The minimum cutoff value should be 60%. But this minimum may be changed depending on the purpose of each study.
After performing the AF with all the original variables and obtained the minimum number of factors that explain the maximum data variability, one must identify if there are inappropriate variable within the set. To do so, one must consider the partial correlations between the variables and the measure of adequacy of the sample (MSA) to each variable. According to Hair et al. (2005, p.98): "The correlations between variables can be analyzed by computing the partial correlations between variables, that is, [...] when the effects of other variables are taken into consideration." The partial correlation and MSA may be provided by the array of anti-image correlation.
Partial correlations should be small, because if they are high, the data matrix is inadequate to AF. It must then examine the values of the MSA for each variable. If there are values in the unacceptable level, variables related to those securities should be excluded.
This procedure is repeated until all the individual variables are within the acceptable level. At this time, then the correlation matrix and consequently the data matrix are longer adapted to a consistent AF.

After verification of the suitability of the data and the analysis of the anti-image correlation matrix, the next step is the interpretation of the final solution and factors which includes factors of the rotation and the analysis thereof.

It must first observe the unrotated factorial matrix which indicates the number of factors to be extracted, ie, the best linear combination of variables that explains the maximum variance of the original data. According to Hair et al. (2005, p.91): "factorial matrix: Table of factor loadings of all the variables for each factor." The factor loadings indicate the most important variables, ie those which have greater weight in each factor.

The factors are extracted in order of importance: the first factor can be understood as the best linear combination of the data explains most of the variability thereof; and the second factor as the second best linear combination of the remaining explaining data variability.

Most of the time, the analysis of the factorial matrix and factors are not easy to do or does not present a clear solution and one of the ways to solve this problem is the use of factor rotation.

The rotation factor is a technique used to improve the visualization and interpretation of the factors, preserving all the statistical properties. There are several rotational methods and, in this paper, we adopted the method of orthogonal rotation varimax factors, being the simplest and therefore the most popular.

Some criteria should be adopted for the significance of the factor loadings and consequently the interpretation of factors extracted, it can be cited the practical significance assurance, very conservative criteria, which should serve as a reference point.

Another criterion, too conservative, is the evaluation of statistical significance, which directs that significant factor loads are obtained based on the size of the sample, for example, with the objective of achieving a 80% power level we have a minimal factorial load 0 75 to be significant in a sample of 50 to 60 observations. According to Hair et al. (2005, p.108), "for smaller samples 100, the lower load factor to be considered significant, in most cases, within ± 0.30. [...] A variable with several high loads is a candidate for elimination. "

One should also consider the commonalities for each variable. According to Hair et al. (2005, p.90), commonality is the "full amount of variance than an original variable shares with all other variables included in the analysis [...] which represent the amount of variance explained by the factor solution for each variable" .

Most often, there are variables that have very low or commonalities that carry no factor. According to Hair et al. (2005), there are two solutions: one is to simply ignore these variables and continue the analysis, and the other suggests the elimination of these variables. The choice of these options depends on the purpose of the researcher and the importance of these variables in the study and in the present study, we chose to eliminate them, because they have little expression in factors.

4 Presentation And Discussion Of Results

Initially it used principal component analysis (PCA), in order to interpret the large amount of data obtained multivariate and subsequently applied the factor analysis (FA) not rotated and rotated for better summarization of data.

4.1 Results Of The Main Components Analysis

The present study showed 46 variables to be analyzed. For variable time and place, all respondents had the same opinion, that is, the variable was only one answer. Therefore, this variable is a constant and has no change (variance equal to zero), and for not adding absolutely no information was deleted from the study of ACP and AF. We work well with 45 variables.

By using the So*ftware Statistical Package for Social Sciences* (SPSS) got 12 principal components (PC) to the data studied, according to the table 01, and the following criteria were adopted to achieve these CP:

- ***Cronbach Alpha*** which is one of CP adjustment indicator. According Maroco (2003, p.250) is "fidelity measure for each dimension and the overall model that is the better the higher this indicator.
- **"Variance Explained (VE)** which measures how each component explains the total variability of the data.
- **Total Variance Explained (VTE),** which indicates how all CP estimated explain the total variability of the data.
- ***Eigenvalue*** **(EV)** that are associated with the eigenvalues of correlation matrix of variables (the higher the better and more associated with certain CP); will be used for the estimation of the CP, only EV greater than 1.

Model Summary			
Dimension	Cronbach's Alpha	Variance Accounted For	
		Total (Eigenvalue)	% of Variance
1	,842	5,658	12,572
2	,829	5,278	11,729
3	,773	4,093	9,097
4	,764	3,958	8,795
5	,703	3,202	7,115
6	,685	3,030	6,734
7	,630	2,603	5,784
8	,538	2,108	4,684
9	,519	2,031	4,514
10	,474	1,865	4,144
11	,443	1,765	3,922
12	,255	1,331	2,958
Total	,995	36,921	82,048

a. Total Cronbach's Alpha is based on the total Eigenvalue.

Table 01 - extracted main components of total variables analyzed
Source: The author

They were extracted from 12 CP to explain the overall variability of the data structure. The first components are those which account for most of the variability in the data and that have larger eigenvalues and *Cronbach's alpha*, and the latter components are to explain the lower part of the variability of the data and those with smaller eigenvalues and *Cronbach's alpha.* As Table 01 above, it has 82.048% of the total variance explained by the CP 12 and an *Alpha of Cronbach's* coefficient of 0.995 indicating good reliability setting.
The *components loadings* are presented values for each variable in each of the CP, i.e., the variance explained by each variable for each dimension (components). In theory, the determinant variables of each CP are those with values greater than 0.5, but depending on the importance, other cut-off values can be adopted, then, for the analysis of components, it is adopted as 0.30 value minimum. To understand the CP, some observations are important. CP that have indexes with opposite signs is understood as a comparison between the variables with positive results and with negative indexes, therefore, high negative values indicate the prevalence of the variables with these indexes. The same applies to high positive values and values close to zero, for a component, indicate balance between variables with opposite indices.

Next, the obtained components are presented:

a) The first component may be understood as a general index, it explains a large proportion of the total variability (12.572%). This component includes 9 variables being 7 with negative indexes and 2 with

positive results. Variables with negative indices involve: teaching supplies, personal realization, third-party influence, Community Involvement, Skill, Domain and Resources. Labor market and Monitoring have positive results;

b) The second component also explains much of the total variance (11.729%) and comprises only variables with positive results, they are: Receiving criticism by the administrator, Compensation, moral behavior, skills development and availability;
c) The third component explains 9.097% of the total variability and understand the variables: Secretariat, Library, compatibility assessments and dissemination of the results, all showing positive and significant indices;
d) The fourth component explains 8.795% and involves variables: Lunch, Harmony between subordinates and superiors, adequacy evaluation, with negative indexes, and Price, Respect for the environment and criticism with positive results;
e) The fifth component explains 7.115% and covers the following variables: Status, curricular component and clarity, all with positive results;
f) The sixth component explains 6.734% and includes the following variables: quality and Sex;
g) The seventh part explains 5.784% and can be understood as an index which explains the views of students on the classrooms, since this component comprises only this variable. The same applies to the eighth, eleventh and twelfth components, and we indices: 4.684% for Good quality 3.299% to 2.958% for Age and communication Influence;
h) Said ninth component 4.514% and is basically a comparison of laboratory and stimulus, respectively with positive and negative numbers;
i) The tenth component explains 4.144% and involves the level of education and curriculum relevance;
j) The eleventh component explains 3.922% and is indicative of the Age;
k) And the twelfth component explains 2.958% and is indicative of the communication influences.

The ACP is just an initial analysis to have an initial view of the variables.

4.2 Results Of Factor Analysis

Prior to execution of AF, it is necessary to verify the adequacy of the data according to the criteria adopted in this work.

Several AF were adjusted by starting with the 45 variables (ACP) until it reached the best fit containing only 6 variables among all analyzed, all of the low partial correlations and values of Sample adequacy measure (MSA> 0.5) above the minimum for a good AF setting.

The ratio of the number of cases and the number of variables is 9.167 (> 5) satisfying the criterion for suitability. As table 02, the Bartlett test statistically significant (BTS = 0.003> 0.05) indicating that the correlations are significant in at least some of the variables. The Kaiser-Meyer-Olklin test showed a value within the acceptable for an adjustment factor (KMO = 0.627> 0.50).

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**,627**
Bartlett's Test of Sphericity	Approx. Chi-Square	34,095
	DF	15
	Sig.	**,003**

Table 02 - Criteria for verifying the adequacy of the data
Source: The author

According to Table 03, the communities associated with each of the variables, the three extracted factors explain 80.3% of variance Laboratories, 70.5% of the variance of credibility of information search, 69% of the remuneration of variance, 68, 3% of the variance of First Professional Option, 67.2% of the variance Assessment Miscellaneous Systems and 63.3% of the variance match between superiors and subordinates. All values of the commonalities are above the minimum adopted (0.5 or 50%).

Communalities		
	Initial	**Extraction**
PRIM_OPCAO_PROF	1,000	**,683**
BUSCA_INFOR_CREDIB	1,000	**,705**
HARMONIA_SUPXSUB	1,000	**,633**
LABORATORIOS	1,000	**,803**
REMINERAÇÃO	1,000	**,690**
SISTEMA_VARIADO_AVALIAÇÃO	1,000	**,672**

Table 03 - commonalities
Source: The author

Total Variance Explained									
Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	**Total**	**% of Variance**	**Cumulative %**
1	**1,971**	32,855	32,855	1,971	32,855	32,855	**1,686**	**28,097**	**28,097**
2	**1,246**	20,762	53,617	1,246	20,762	53,617	**1,428**	**23,794**	**51,890**
3	**,968**	16,131	69,747	,968	16,131	69,747	**1,071**	**17,857**	**69,747**
4	,675	11,243	80,991						
5	,640	10,670	91,661						
6	,500	8,339	100,000						

Table 04 - variance explained by each factor and the total explained variance
Source: The author

Factor analysis showed the results as shown in Table 04. Initially, according to the Kaiser criteria, extracted 3 factors with eigenvalues close to or greater than 1, and the same at the discretion of the accumulated variance, explain 69.747% of the total variance. After making the varimax rotation, it is clear that all eigenvalues are greater than 1, indicating good extraction of components.

Table 05 presents the factor loadings for each variable in the 3 factors extracted, before rotation. Note that the first factor encompasses four variables, the search for information on higher load credibility. Since the variable First professional option has high factor loadings in three components. The second factor includes only the Harmony variable between superiors and subordinates. The third factor just Laboratory.

Component Matrix			
	Component		
	1	**2**	**3**
PRIM_OPCAO_PROF	**,534**	-,491	,395
BUSCA_INFOR_CREDIB	**,700**	,425	
HARMONIA_SUPXSUB	-,459	**,650**	
LABORATORIOS	-,411	,388	**,695**

REMINERAÇÃO	**,664**	,466	
SISTEMA_VARIADO_AVALIAÇÃO	**,612**		**,513**

Table 05 - factorial loadings not rotated
Source: The author

Following the consummation of the *varimax* rotation, interpretation of factor loadings for each variable becomes more clear and simple. Table 06 shows the factor loadings after rotation and, consequently, the final interpretation of AF. It shows a better distribution of the factor loadings for each variable in each of the factors, mainly for professional First Variable option that previously presented next load factor on each of the three factors.

Rotated Component Matrix			
	Component		
	1	**2**	**3**
PRIM_OPCAO_PROF		,823	
BUSCA_INFOR_CREDIB	**,830**		
HARMONIA_SUPXSUB		**-,698**	0,3803
LABORATORIOS			**,866**
REMINERAÇÃO	**,826**		
SISTEMA_VARIADO_AVALIAÇÃO	**,528**	0,48645	**,396**

Table 06 - factorial loadings after rotation
Source: The author

Faced with the AF adjusted, it is noted that the first factor includes, after the rotation, only 03 variables, as follows: Search for information about credibility and Compensation (both with high factor loadings) and various evaluation systems (with lower factor loadings) . This factor can be understood as a vision of the students on what the course of administration may offer its students (in terms of credibility and Compensation Professional Administration) throughout their professional lives as managers. This factor also expressed, to a lesser extent, students' views on the assessment of the various systems.

In conclusion, this first factor is an overview of the students interviewed about their own business course, their learning while students and the factors that motivated this choice.

The second factor, which once encompassed only one variable, after the rotation, now has the variable First professional option with high factor loading and harmony between superiors and subordinates with less load. Therefore, this factor can be interpreted as a comparison, made by the students, from the very course of administration and human resources of the institution they attend.

The third factor encompasses only the variable laboratories with high factor loading, and can be understood as the views of respondents about the facilities and equipment of the university in question.

5 Final

Map and draw conclusions about the opinion of individuals is a complex task because it involves data that are not easily measured in this way, to make this check, this study used statistical techniques of multivariate analysis. Among these techniques, we can cite the principal component analysis (PCA) and factor analysis (FA), which were chosen because the data are very extensive and require short, without that occurred great loss of important information.

Data analysis began with the ACP, which allowed an overview of the variance and covariance structure before being eliminated some variables. Then, several AF were tested, in order to synthesize a better fit the data,

and set to aid the visualization and interpretation of the results of the AF applied, the better this adjustment, the orthogonal varimax rotation technique.

From the above in this paper, we found that the multivariate analysis, above, proved to be important tools for the study of data not readily measurable, confirming the potential of these techniques in support of research that involves a lot of variables.

From the analysis of the interviews, it was found that most respondents had the course of Directors as a first career choice. In the case of this image undergraduate degree at the University in question, we can see a concern on the part of students, with the credibility of this institution and the remuneration of these professionals in the labor market. The participants of this research consider it important that the institution has different evaluation systems and believe it is essential to have good relationships among professionals of the institution and its students. Finally, we see the importance of the institution has an appropriate framework, both in its physical part, as investments in laboratories and computer equipment.

Given the above factors and based on the information obtained, it is suggested that improvement targets are set so that the image of this institution can become the best possible before its main target audience, their students.

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Active methodologies, Education and Knowledge Production: Alternatives and the Pedagogical Perspective Lecturer

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Abstract

Man is a being eminently social and with the passage of time brings with it the marks of culture that are expressed in your body, on your way to live. The issue of education has been a generator of debates, surveys and various interventions, and articulates and builds on proposals and establish strategies that contribute to the change in values, understandings and attitudes. Objective of this study is to realize the existing level of knowledge on the Active methodologies in a superior. O educational institution teacher should be organized so that the Active methodologies are an efficient process in the formation of their students. Also, an interesting challenge is the records of the ways the experiences of students and teachers carried out with these methods and their effects to the students, in order to expand the reflections and the evidence of their pedagogical benefits.

1. Introduction

Active Methodologies can understand as a methodological alternative in dealing with knowledge, which is linked to the issue of autonomy, questioning, approach and involvement. The use of these methodologies can arouse curiosity, stimulating taken of individual and collective decisions, connected to core activities of social practice and student contexts. Discuss, investigate, examine, reflect and position themselves critically are traits present in this approach. It is essential that the teacher participates in the process of rethinking the construction of knowledge, in which mediation and interaction are essential prerequisites for learning to occur.

Education is seen as the process of development of skills, attitudes and other forms of conduct required by society. Global process that aims at the integral formation of a person, to meet the needs and aspirations of personal and social nature (BRAZIL, 1981).

According Nérici (1990), education is understood as a process that aims to guide the student to a state of maturity that enables it to meet constantly with reality, so that it can act efficiently and responsibly in order to be observing the individual and collective needs.

Duarte (1986) says that the general education concepts give greater emphasis to its subjective dimension, ie those aspects of your practice linked exclusively to the subject of education, their individual improvement and the achievement of certain moral ideals and taken intellectuals like higher, irrespective of time and place.

The aim of this study is to realize the existing level of knowledge on the above methodology of work in a higher education institution, with teachers involved with higher education as a group of such studies. It is hoped that this research establish action strategies involving the theme.

2 Methodologies Live, Education and Transformation

According to Coll (2000) there are two conditions for the construction of meaningful learning: the existence of a potentially significant content and the adoption of a positive attitude to learning, ie the own of the student posture for establishing associations between new elements and those already present in their cognitive structure. Unlike in rote learning, you cannot establish relationships between the new and previously learned. Moreover, meaningful learning is structured, complexly, in a move of continuity / rupture. The follow-up process is one in which the student is able to relate the contents seized to previous knowledge that is, the new content must be based on existing cognitive structures.

The process of breaking, on the other hand, is established as from the emergence of new challenges, which must be worked out by the review, taking the learner to overcome their experiences - preconceptions, previous syntheses and others stress that ends up enabling the expansion of its knowledge possibilities.

For Freire (2007, p.20), the respect for the autonomy and dignity of each is an ethical imperative and not a favor we can or not to grant each other. For him the teacher who disrespects the curiosity of the student, their anxiety and their language, transgress the fundamental ethical principles of our existence.

To Faria (1974 cited by Oliveira et al, 1988) every social group in a given historical period, has a collective consciousness, life values and education, which are expressed in the abstract and generally, through the purpose or purposes of education, which express, ultimately, the fundamental needs of the company concerned.

Man is a being eminently social and with the passage of time brings with it the marks of culture that are expressed in your body, on your way to live.

It can be seen as well the great relationship between education and culture. Education as a social phenomenon, has shown a conservative formation on the one hand, and a refreshing function on the other. In today's society it is noted a dichotomy between education and culture, the way it is transmitted.

Placing Azevedo (1964 cited by Oliveira et al, 1988) the conservative function of education becomes evident, consisting of a process of transmission of traditions or culture of a group, from one generation to another. As historical expression, Chagas (1980) considered the conservative function of education as to transmit to new generations the values, ways of life and the previous generation modes of behavior.

To Cyrino and Torrales (2004), the active methodologies use the questioning as a teaching and learning strategy in order to reach and motivate the student as to the problem, it stops, examines, reflects, relates their story and passes to reframe his findings. The questioning can take you to the contact information and the production of knowledge, mainly for the purpose of resolving the impasse and promote their own development. Realizing that new learning is a necessary and significant tool to enlarge its possibilities and paths that can exercise freedom and autonomy in making choices and decision-making

The issue of education has been a generator of debates, surveys and various interventions, and articulates and builds on proposals and establish strategies that contribute to the change in values, understandings and attitudes.

Through education man becomes more aware and responsible for their actions, to meet the needs and personal and collective aspirations.

Ferreira (. 1999, p 1822) indicates nine different meanings for the word education, some of which are shown below:

"Act or effect of educating (if) ...; Process of development of physical, intellectual and moral of children and human beings in general, aiming at their better individual and social integration ...; Knowledge or skill

resulting from this process, preparation ...; Level or type of education ... improvement of all human faculties ... ".

According to Santos (2000) all humans are involved in a process of interaction, social interaction and education, formal and informal. The same author described below as well:

For formal education means that occurs in the school, including the political and social preparation of the individual, providing it with conditions that make it possible to understand, analyze and interpret your reality and allow you to participate in the historic building society. It is their training as citizens. Only the school can accomplish this task, universally, egalitarian and democratic. Formal education follows a pre-established and systematic plan, has intentions and goals set.

By informal or non-formal education, it is understood that is processed outside the school system. In this type of education there is no systematic plan, it corresponds to the process of acquiring knowledge, experience, ideas, values and practices that are not focused, or specifically linked to educational institutions, although they have a very strong influence importance in educational training as a whole.

The changes occurring in education caused in humans able to adapt in their midst, understanding and participating actively in the surrounding.

Ponce (1986 cited by SOARES, p.34, 2004) says that education:

[...] Is a process by which the ruling classes prepare the mentality and behavior of children the basic conditions of their own existence [...] education is not an accidental phenomenon in a class society.

Education and culture are closely linked. It is through them that traditions and customs are shown and reevaluated constantly.

In terms of a restorative function, Saviani (1982) emphasized that education aims to promote human and so are their needs that determine educational goals, needs should be specifically considered as the educational activity is always within a framework existential. According to Chagas (1980), renewing the function of education is related to the modification and enrichment of the culture of the previous generation, due to the influx of other realities and needs.

The changes currently occurring in society are a way to innovate and enrich the legacy left to future generations.

The relationship between education and social transformation is clearly evidenced by Gadotti (1984 cited by Oliveira et al 1988, p. 4) while emphasizing that:

It is false to claim that nothing can be done in education until there is a transformation of society, because education is dependent on the society. Education is certainly not the lever of social transformation. But if she cannot do alone transformation, this transformation will not be consolidated without it.

Following this line of thought, Cunha (. 1984, p 10), to argue in favor of education as more product than factor of society, mentioned that:

> "Think that education is the mobile social transformation is a naive position ... The relationship between society and education is so strict that, in the same way that education cannot be responsible for social change, no change can occur without it".

There is a perfect interaction between education and social transformation, change is only achieved when both are connected.

Some considerations were made by Freire (1984 cited by Oliveira et al, 1988) on the relationship between levels of education, knowledge and ignorance; among them, that the wisdom of ignorance. There is no absolute ignorant ... What they lack is the systematic knowledge; it is understood that schools have most of the guidance for the systematic knowledge.

It is up to school the systematization of knowledge. The literacy capacity is linked to the condition of building and assimilate new skills within or outside the school environment.

Rodrigues (. 1985 cited by Oliveira et al, 1988, p 5) described the school evolutionary process:

> "The oldest history of education groups indicates that in the exercise of an act of freedom, created transmission instruments of his conception of the world to other groups of individuals. In primitive societies, this occurred informally. In historical societies, this occurred in an organized and regular way. The invention of writing and later the press finally broke the cycle of oral transmission in literary societies, generating the need to create production institutions, organization and dissemination of culture, under the édige more prepared individuals for the exercise of this function: intellectuals. This has increased the importance of circles documenting the values and intellectual achievements considered superior and should be preserved both by the accumulation of these records as for its diffusion. So begins to rise school, due to the need to preserve and reproduce beliefs, values and social achievements, conceptions of life and world groups or classes. She stood and modernized, as it was able to become powerful tool in the production of new values and beliefs, in the dissemination and socialization of social achievements, economic and cultural of these groups or classes".

The school's mission from the beginning was to impart knowledge to all who were part. With the innovations through the laws and resolutions, applied more diversity of teaching and learning.

Lenhard (. 1978 cited by Oliveira et al, 1988, p 6) characterized the school's emergence as a social institution summarized as follows:

> "by socialization, man becomes truly human; the adult generations of all societies strive for driving the socialization of new by what we call education; social differentiation is accompanied by the institutionalization of education as a distinct social activity; with the emergence of teaching as a specialized occupation appears to school and, with it, the institution acquires sharp contours; school activity isolates certain learning for the segregated treatment of "real life"; such treatment basically takes the instructional features, ie systematic transfer of knowledge".

With the institutionalization of education and the emergence of teaching, the school is seen as a form of transmission of specific knowledge with the purpose of improving the knowledge and lead the students to a life of success and professionalism, thus treating education in a perspective transformation.

Given these evolutionary aspects and activities developed at school today, it has to be the systematization, intentionality and organization, directly related to the contents and methods of transmission of knowledge, are constant and indispensable elements in the characterization of schooling.

Mitri et al. (2008) explain that the active methods use questioning as a teaching / learning strategy in order to reach and motivate the student as to the problem, he stops, examines, reflects, relates their story and begins to reframe their discoveries. According to the authors, the questioning can lead the student to the contact information and the production of knowledge, mainly for the purpose of resolving the impasse and promote their own development. Learning through questioning and / or resolution of problems in their area, so it's one of the possibilities active involvement of students in their own training process.

The school is a key institution in contemporary society. As Lenhard (1978 cited by Oliveira et al, 1988) its central function is to transmit a part of the cultural heritage from one generation to another and there is a direct correlation between a nation's level of development, well-being of its people, and parameters school.

The theory of social reproduction has exerted considerable influence on contemporary Brazilian educational thought. Thomaz (1984 cited by OLIVEIRA, 1988), ranks the school as an ideological apparatus

of the state in the service of the ruling class, which uses it to maintain its power. Although regarded as partially autonomous institution which carries out the function of forming the student's attitude about the technical and social division of labor and obedience to the social order.

Bourdieu and Passeron (1975 cited by Oliveira et al, 1988) attributed to the school playing political function of social structure, particularly the relations of domination of one class over the other, in capitalist society. Thomaz (. 1984 cited by Oliveira et al, 1988, p 7) summarized what are, in the opinion of theorists of social reproduction, the school functions:

Teach students the physical and intellectual abilities necessary to carry out different functions in the workforce; inculcate rules of behavior, order, obedience and discipline appropriate to the efficiency of social relations.

From the brief consideration of social reproduction function of school, some issues deserve special attention by those involved with the school. Especially in a structurally unequal and unjust society like Brazil, which is the ability of the school to exercise a refreshing function? If no such possibility, to what extent there is a direct correlation between school and social transformation? (Oliveira et al, 1988).

Mello (1983, p. 72) to critically review the reproductivist theory, it considered the fact that a good education allows to acquire a world view less mystical and folk, which can be a starting point for a critical understanding of society as well the school can find its role in social transformation so defined:

> "…in very simple terms, it would be taught, and well, to read, write, calculate, speak, think, know the physical and social world, that school education could play for the majority of the population layers that promotes role of non - equality, since society is structurally unlike - but improving the quality of life."

The important role played by contemporary school requires, however, effective participation in society. According to Cunha (1984) the educational institution will always be a place of conflict, debate, criticism, transformation, because, in this view, those who seek their lives, those living, those who aspire to a better life, are always unhappy. These conflicts, debates and criticism are indispensable for transforming school and depend greatly on the degree of involvement of society, represented by all its segments.

This school will only become possible if it is assumed by the various segments of the population as an indispensable tool for the design of a project of society where the value of the human being is above all ideological, partisan or religious differences; a pluralistic society that will get with wisdom, fertility speech, alternative, not only for survival, but above all of living well, for those who participate in it.

Experience indicates that learning is more meaningful with active learning methodologies. In addition, students who experience this method acquire more confidence in their decisions and application of knowledge in practical situations; improve relationships with colleagues, learn to better express orally and in writing, acquire like to solve problems and experience situations that require decisions on their own, reinforcing autonomy in thinking and acting (Ribeiro, 2005).

3. Talking With Teachers: The Methodologies Live As Process

After applying the research instrument, data were categorized in the way shown below:

Adoption of difficulties of working methods in the face of teacher education

For the group studied the work with this type of methodology can will require changes in educational curricula, because You determine skills need to be addressed so that the procedures can be adapted and really

bring about change. So the teaching action may be guided by the process units and general and specific knowledge can be secured as well as the assimilation of same by students...
These new skills demonstrate the need to change the perception and how to relate to the surrounding world by modifying the mechanistic approach, fragmented, competitive and hegemonic approach to a systemic, holistic, co-operator and integrator. And understand that the problems facing humanity today can no longer be understood separately, but rather an interconnected, interdependent and contextualized way.
Importantly, active learning refers to strategies to enable the student. The teacher, in principle, is (or should be) in an active role in teaching as it has to resort to his studies, selecting information, choose proper terminology, explain knowledge in different ways, making relationships, comparisons, analogies etc. Subtends is that if the teacher applies the same lesson plan dozens of times without innovations, it is likely that in this case, their exposure becomes routine, automatic and, of course, have a passive and not active character.

The process of autonomy and power structures

The study group believes that the teacher should take the facilitator roles, advisor, moderator and observer and student the protagonist of their learningand the classroom should be the stage of discussions on the deepening of the contents under the guidance of teacher the time the teacher is dedicated to measuring the learning evaluation, the clarification of conflicting points of understanding and ownership of the anticipated content.
Teachers have raised employment opportunities for the student to be placed in front of problems and challenges that mobilize their intellectual potential, while studying to understand them and or overcome them. Students need information but are especially encouraged to work with them, elaborate them and reworks them depending on what need to respond or equate. In this way, it is possible that, gradually, the development of the scientific spirit, critical thinking, reflective thinking, ethical values, among other achievements of this nature, through education at different levels, contributing to the development of autonomy in training of the human being and of future professionals.

4 Final

Map and draw conclusions about the opinion of individuals is a complex task because it involves data that are not easily measured in this way, to make this check, this study used statistical techniques of multivariate analysis. Among these techniques, we can cite the principal component analysis (PCA) and factor analysis (FA), which were chosen because the data are very extensive and require short, without that occurred great loss of important information.

Data analysis began with the ACP, which allowed an overview of the variance and covariance structure before being eliminated some variables. Then, several AF were tested, in order to synthesize a better fit the data, and set to aid the visualization and interpretation of the results of the AF applied, the better this adjustment, the orthogonal varimax rotation technique.
From the above in this paper, we found that the multivariate analysis, above, proved to be important tools for the study of data not readily measurable, confirming the potential of these techniques in support of research that involves a lot of variables.
From the analysis of the interviews, it was found that most respondents had the course of Directors as a first career choice. In the case of this image undergraduate degree at the University in question, we can see a concern on the part of students, with the credibility of this institution and the remuneration of these professionals in the labor market. The participants of this research consider it important that the institution has different evaluation systems and believe it is essential to have good relationships among professionals of the

institution and its students. Finally, we see the importance of the institution has an appropriate framework, both in its physical part, as investments in laboratories and computer equipment.
Given the above factors and based on the information obtained, it is suggested that improvement targets are set so that the image of this institution can become the best possible before its main target audience, their students.

In this study, it is clear that in relation to the perceptions and concepts methodologies and population teaching processes under study, there is a way of working already established between teachers, which for some is consolidated on the tripod: lecture prepared by the teacher, fixing the content by the student and evaluation process.
Regarding the teaching planning, analysis of the reports makes it possible to perceive the importance that is attributed to the teacher as facilitator of the teaching process, as a prerequisite to achieving the proposed educational objectives.
The student participation in decision-making and mediation striking feature in Live methodologies, appear as point it lacks didactic and methodological instrumentation for future interventions. Channels and processes need to be established for the acquisition of knowledge becomes significant.
For the Active Methodologies can have an effect on the direction of intentionality in which they are established or elected, it will need to process participants to assimilate, to understand them, believe in their educational potential and include a good deal of intellectual availability and affective (appreciation) to work as proposed, as are many of the teacher's own conditions, pupils and school routine that can hinder or even prevent this intent.
The interaction with their teachers is a major source of motivation to improve quality. Empathy with the teacher facilitates personal identification with what he presents in the classroom, enabling the enhancement of proposed activities and content and the internalization of external demands or requirements. On the latter, students endorse or start to realize how their demands to carry out quality work, which contributes to the promotion of autonomous motivation that is associated with deep processing of information, creativity, persistence, preference for challenges, among other positive results.
The teacher should be organized so that the Active methodologies are an efficient process in the formation of their students. Also, an interesting challenge is the records of the ways the experiences of students and teachers carried out with these methods and their effects to the students, in order to expand the reflections and the evidence of their pedagogical benefits.

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Liberal Democratic Perspective Of The Nigerian State

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Abstract

Since it emergence into the political dictionary centuries ago; democracy has been frequently used as a "loose" concept. It has overtime the years developed off-shoots and branches, part of which is liberal-democracy. This study was undertaken to examine the practice of liberal-democracy of the Nigerian State. The study relied on secondary source of data collection. From the findings of this paper, liberal-democracy in the Nigerian state is characterized by problems of corruption, election rigging, ill-preparedness among others, which have hampered the practice. Furthermore, the study pinpoints how these "democratic evils" have been hindering the practice of free-flow democracy. Finally, the study outlines some suggestions to ensure a democracy capable of guaranteeing maximum practice of freedom in the Nigerian state.

Key words; democracy, Liberal-democracy, State

Introduction

The word democracy originated in Greek around the fifth century E.C. Demos referred to the common people, the masses, kratos meant 'power'. It is a type of governance in which all citizens exercise power and civic responsibility, directly or through their freely elected representativeness. Thus, a true democracy, i.e. a system in which all citizens meet periodically to elect state officials and personally enact laws, has been extremely rare.

There are different kinds of democracy. Even dictatorial regimes claim some indicators of "democracy". But the concern of this paper is liberal democracy. It is a democracy that protects the freedom and rights of its citizens which are embedded in a constitutional framework and that guarantee a much broader spectrum of social and economic rights. Today countries all over the world including Nigeria are claiming to be practicing this form of democracy.

Democracy has grown in leaps and bound to become the most widely and popularly used concept in the world today. This has led to the emergence of different kinds of democracy in the world. While it is yet true that Nigeria is governed by democratically elected leaders at the federal and state levels, she is yet to institutionalize democracy after a century of existence as a political entity. This paper discusses/analyses some of the characteristics/features of liberal-democratic theory and it level of conformity in the Nigerian state, these include, free, fair and competitive elections, multiple distinct political parties ,separation of powers into different branches of government ,rule of law ,equal protection of human rights ,political freedom for all persons and constitutional form of government.

Systematically, this paper is sub-divided into four different parts. In addition to the introduction, the next segments of the paper examine the conceptual and theoretical extrapolations and postulations of the major concepts. Meanwhile, the final segment looks at the empirical and concrete perspectives of the liberal – democratic theory on the Nigerian variant of State and politics. The paper ends with conclusion and policy recommendations.

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Conceptual And Theoretical Clarifications Democracy

Democracy may be a word familiar to most, but it is a concept still misunderstood and misused in a time when totalitarian regimes and military dictatorships alike have attempted to claim popular support by pinning democratic labels upon themselves. Democracy is a household political concept in many parts of the world today, which often reoccurs at various political participation discussions. Any government (civilian or military) now laid claim to it because it sounds as an ideal form of government. However, the controversy surrounding the employment of the concept is a clear indication that it means different things to different people and societies (Abia; 2003; 55).

In the dictionary definition, democracy "is government by the people in which the supreme power is vested in the people and exercised directly by them or by their elected agents under a free electoral system." In the phrase of Abraham Lincoln, democracy is a government "of the people, by the people, and for the people.
Sartori (1965; 19) conceive of democracy as "the power of the people and the rule of the people". Furthermore, Appadorai (1975:137) describes it as 'systems of government under which the people exercise the governing power either directly through representatives periodically elected by them'. Schumpeter (1967:153) reduces the concept to the procedural, when he defines the democratic method as the 'institutional arrangement for arriving at political decisions in which individuals require the power to decide by means of a competitive struggle for the people's vote". And from the Marxist point of view, as represented in the work of Marx and Engels (1981). The communist Manifesto, democracy connect the dictatorship of the proletariat", that is to say, majority rule of the common people, the plebians.

Democracy is "governance by leaders whose authority is based on a limited mandate from a universal electorate that selects among genuine alternatives and has some rights to political participation and opposition." (Danziger 1998, 159)

Democracy is a political system in which different groups are legally entitled to compete for power and in which institutional power holders are elected by the people and are responsible to the people." (Vanhannen 1997, 31)

Democracy is "government by the people; that forms of government in which the sovereign power resides in the people as a whole, and is exercised either directly by them. . . or by officers h Dictionary, 1933)

Liberal –Democratic Theory

The word "liberal" emerged from "liberalism". Hence, Liberalism is a political philosophy or worldview founded on ideas of liberty (which is especially stressed in classical liberalism) and equality (which is more evident in social liberalism). Liberals espouse a wide array of views depending on their understanding of these principles, but generally they support ideas such as free and fair elections, civil rights, freedom of the press, freedom of religion, free trade, and private property.

It is important to know that there exists different liberal-democratic theorists and virtually all can agree in their endorsement of representative democracy where representatives are chosen in accord with formal procedures combined with state protection of political and civil liberties and a private sphere free of state interference.

J.S Mill set out what is often considered the first systematic explication and defence of liberal democracy.

Liberal democracy is a political system with representative governments elected by popular majority, the rule of law enshrined to protect individuals and minorities, and a significant sector of economic, associational, and communicative activity that is largely autonomous from government control. It rests upon the principles of individual liberty, civic equality, popular sovereignty, and government by the consent of the governed. Liberal democracy's institutional characteristics and principles are mutually dependent. Popular sovereignty exercised through the periodic election of representatives, together with a representative government constrained by the

rule of law, a separation of powers, and constitutional rights, helps to secure individual liberty. Concomitantly, individual liberties, civic equality, and limited government support democratic governance. They undergird a vibrant civil society, a prerequisite for the effective exercise of popular sovereignty.

State

It is difficult to do away with the State as a concept in the study of politics. There is no single universally acceptable definition of the State. The state is the most powerful of all social institutions. It has become one of the important factors in our social life today. Different scholars have defined state diffidently according to their individual view point. Scholars from the two major ideological strands of Liberalism and Marxism have neither agreed on a universal definition of the concept of State. Some of the important definitions of the state are mentioned below;

Liberal theorizing on the State, as a concept, contends that the State is a political organization of human society that comprises organized attributes of contemporary institutions like the legislature, executive and judiciary, with respective roles. These are governmental institutions that make and enforce laws that are binding upon the people within a defined geographical territory. Liberal scholarship therefore sees the State as an institution for orderly progress of the society and an embodiment of justice for all, not just for a few (Bourgeois class).

Classical Marxist‟ View of the State therefore shows that it is an institution with established apparatuses purposely and directly meant to defend and maintain a class domination and class exploitation. Thus, the control of the State apparatuses by the ruling elites is for, and in the whole interest of the bourgeoisie (Abbass, 1990; Shaapera, 2009 and Abbass, 2010)

Marx Weber gives the rather most popular definition; he defines the state as “the human community that successfully claims the monopoly of the legitimate use of force”

Woodrow Wilson defines "state as a group of people organized for law within a definite ternary." Burgess defines state as "a particular portion of mankind viewed as organized unity."

Bluntschil says that; "the state is a combination or association of men in the form of Government and governed, on a definite territory, united together into a moral organized masculine personality, more shortly person of definite territory."

Prof. Laski defines state as "a territorial society divided into Government and subjects claiming with its allotted physical area of supremacy over all other institutions.

J.W. Garner gives a very comprehensive definition of the state. He holds the view that the state as a concept of political science and public law, is a community of persons, more or less numerous, permanently occupying a definite portion of territory, independent, or nearly so, of external control and possessing an organized government to which the great body of inhabitants render habitual obedience." It is considered to be the best definition of the state. It can be summed up as "the state is a collection of human beings occupying a definite territory under an organized government and is subject to no outside control."

This paper adopts the elite theory as the theoretical framework for this discourse. The theory was made popular by its major proponents such as Vilfredo Pareto (1935), Gaetano Mosca (1939), Wright Mills (1956) and Geraint Parry (1969), etc. In this theory elites are observed as the few powerful people in the society who have and wield a lot of influence in the political, economic, and social realms. According to Okereke(2003),Mosca is quoted to have argued that “in all societies from societies that very meaningful developed and have barely attained the dawning of civilization down to the most advanced and powerful societies-two classes of people appear-a class that rules and a class that is ruled. The first class ,always the less numerous, performs all political functions, monopolizes power and enjoys the advantages that power brings, whereas the second, the more numerous class ,is directed and controlled by the first ,in a manner that is now more or less legal ,now more or less arbitrary and violent”

The essential theme of this theory is that there is in every society a minority of the population which takes the major decision in the society. As those decisions have political implications, the elite exercise considerable political influence. Clearly, elite theory describes a government that operates in an undemocratic fashion.

Relating the elitist theory to this paper is for some facts that Nigeria is divided along segmental elite lines. However, how this decision is taking viz – a - viz the tenets of liberal democracy and its practice in Nigeria is the major concern of the paper.

The various principles of liberal-democratic theory highlighted above would be carefully x-rayed in the light of the Nigerian state. The principles include; government by the consent of the governed, individual liberty, civic equality, and more importantly, private sphere free of state intervention.

Government By The Consent Of The Governed

This principle is a basic fundamental pillar of the concept of democracy. It can also be termed as representative government which stems from the conduct of free and fair elections competitive elections. Government by consent can only be achieved through the conduct of elections. Elections play important part of representative democracy. Individuals and groups have to compete in an open contest for the peoples votes. When this is done fairly and creditably, the wishes of the people would easily prevail.

Nigeria since her independence as a political entity has experienced several types/forms of government; that is, government by the consent of the governed and the government without the consent of the governed, i.e civilian and military government and regimes. All the military regimes that we have had in Nigeria have all come into power without the propel approval from the governed/electorates. Hence, it has failed/fall-short of this principle of liberal-democracy. In total, Nigeria experienced her first military intervention in politics on January 15, 1966 and since then there has been four other successful coups, 2 abortive coups, one attempted coup and 3 alleged coups all by different military government at different times in history.

However, the government by the consent of the governed which must come from the conduct of a free,fair and competitive elections, as also been slightly dysfunctional due to the fact that elections conducted in Nigeria have to a large extent been far from been free,fair and competitive. Elections serve as one of the major instrument for selecting political officeholders. It serves as means of ensuring accountability and mobilization of the citizens for political participation. Yet, elections in Nigeria have always been characterized by malpractices such as: election rigging, snatching and stuffing of ballot boxes, political intimidation and assassination prior to during and after elections.

Elections are critical aspects of democratic framework for governing modern political societies. They serve as instruments of political choice, mobilization and accountability. In the context of liberal democracy in the world, elections are to facilitate the smooth transition from one civilian administration to the other and help in legitimizing sitting governments.

Since her return top civil rule in1999, the Nigerian experience with general elections has shown that the political elite have not truly come to terms with the referents of elections for democratic sustenance. More often than not, the elite has failed to play by the rules of competitive electoral politics has failed to play by the rules of competitive electoral politics which prioritizes politics of tolerance, conflict and consensus, bargaining and compromise. They see elections as warfare, characterized by gangstreism and political disorder. Political parties which organize for elections are also, like armband of men and women going to war, where there must be victors and the vanquished. Elections in Nigeria have become warfare where it is a sin to lose.

Election is central to the effective functioning of modern representative democracy. Since direct democracy has become almost impossible to practice on account of the large population in every modern political society, electing or selecting political leader through periodic elections has become the norm. This particularly so under liberal-democracy. Under liberal-democracy, elections play wider roles such as instruments of accountability, mobilization of the people, promotion of legitimacy.

All these principles/features listed above have been noticeably absent in Nigeria, thereby making void the feature of government by the consent of the governed through the conduct of elections under the general umbrella of liberal-democratic theory. Looking at all the present happenings that are currently beclouding the 2015 general elections, it seems evidently clear that the 2015 general elections would actually have all the trappings of a "liberal-undemocratic" theory that previously surfaced during the 2003, 2007 and 2011 elections in Nigeria.

Individual Liberty

One of the holding principle/pillars of both liberalism and liberal-democratic theory is liberty, which is encapsulated in sub-principle such as; civil rights, freedom of press, freedom of religion, freedom of movement, speech, association, etc, i.e Fundamental Human Rights. All these are needed in a society where the principle of democracy is widely pronounced and held in high esteem.

Going by the fact that Nigeria as experienced both sides of the coin of governance, i.e, military and civilian rule. It is imperative to note that there exist different levels of individual liberty. Military regimes in the country are normally known for the suspension of constitution and these constitutions contain the fundamental Human Rights in which the principle of liberty is embedded. This made the principle of individual liberty to be totally absent in Nigeria during this period.

Furthermore, the promulgation of decree no 2 of 1975 also during the military regime is an instance whereby the principle of individual liberty was totally absent. The promulgation of the decree no 2 (1975) granted the state the full rights to arrest detain and prosecute anybody who opposed it policies and government, without giving such an individual the opportunity to stand for trial and appeal before the court of law.

In partial contrast, democratic dispensations in Nigeria have not fared any better. Though, civilian/democratic regimes are not known for suspension of constitution, hence the FHRs remain intact. Yet, notwithstanding the principle of liberty still remains seriously threatened. Different democratic regimes have limited the liberties of citizens of the country in various ways; the freedom of press which is part of the principle of individual liberty has been greatly inhibited and constrained. The Nigerian media only broadcast news items which the government gives it permission to do. Also, despite the promulgation of the freedom of Information bill in 2007, information still has been limited and not free and available to the Nigerian public for scrutiny. Cases of pressmen been suspended and arrested for performing their rightful duties and obligatios have also been the order of the day in Nigeria.

All these and many other more does not speak well of a country that is widely acclaimed to be practicing liberal-democratic theory.

Civic Equality

According to J.S Mills, one of the leading advocates of liberal-democracy 'the pure idea of democracy' is "government of the whole people by the whole people, equally represented", which requires proportional representation so a minority is not denied government representatives, hence he was justly classified as an egalitarian. He insisted not only on political equality, but also social and economic equality. Hence, it can be pointed out here that Mills' principle of civic equality was based on proportional representation, so as to avoid the denial of minority government representatives.

Nigeria is a country of extraordinary diversity and extraordinary complexities, these complexities are a reflection of the avalanche of ethnic groups co-habiting the territory and intricacies of interaction among them. Hence, there are over 450 ethnic groups in the country. The avalanche of the ethnicities that are present in the country had made the issue of equality and proportional representation a very difficult task to achieve, despite every attempt by the federal government to achieve a considerable amount of civic equality in every sector of

the country. Different measures have been adopted by the federal government of Nigeria to ensure the required level of equality and proportional representation, some of these include; federal character principle and resource allocation, amongst others.

The federal character principle was a policy that was entrenched in the 1979 constitution of the federal republic of Nigeria to cater for the diversity in the country. The principle state thus "the composition of the government of the federation or any of its agencies and the conduct of its affairs shall be carried out in such a manner as to reflect the federal character of Nigeria and the need to promote national unity, and also to command national loyalty, thereby ensuring that there shall be no predominance of persons from a few states or from a few ethnic or other sectional. Groups in that government or any of its agencies" according to the designators of this principle, it is described as a distinctive desire to give every citizen a sense of belonging to the nation notwithstanding the diversity and multiplicities of ethnicities present in the country. Nigeria has over the years experienced various inter-ethnic rivalry between groups, hence, there was the need and importance to make a provision that would prevent against the domination of the government and it various agencies by a single ethnic group, that is, ensure equality on all levels. However, a twist to the attempt to ensure equality in the country through the entrenchment of this principle has been met by different forms of opposition either directly or indirectly. Some of the critics of this principle have argued that the principle aims at disregarding the major principle of merit in the various appointments into the civil service, military. Police force etc therefore they believed that instead of the principle promoting the idea of equality which it was created for, it otherwise promotes inequality in the country.

Private Sphere Free Of State Interference

This is a very crucial principle of liberal-democracy theory. It emphasizes the significant sector of economic, associational, and communicative activity that is largely autonomous from government control, that is, it can also be termed or referred to as a system of capitalism. The Nigerian state is pursuing the economic policies aimed at formation of the market environment, private business, and improvement of investment climate in the state. Three problematic factors have been identified for doing business in Nigeria; access to financing, inadequate supply of infrastructure and corruption, infrastructure that constrains development. Hence, it can be agreed that what actually operates in Nigeria is pseudo-capitalism, which means capitalism that pretends to be what it is really not. Notwithstanding, the government has taken some steps in attempt to be less involved in the economic and other related affairs of the state, therefore undertaking different policies meant to achieve this, some of which include, privatization and deregulation of various sectors of the economy.

The federal government of Nigeria through it privatization policies has been able to less interfering in the power sector of the country. The federal government was able to successfully privatize the power sector of the country, that is, the Power Holding Company of Nigeria was successfully handed over to foreign private investors to take over its management and ownership. However, this is not without having some elements of government stake in the investment. It was reported that some of this foreign companies that hold ownership of this business acted as frontrunners for government politicians who are actually the real owners of this business. Therefore, the earlier claim of Nigeria operating a pseudo-capitalist economy is rightly justified. State has continued to inherit public policies for national development from the International Capitalist system and thus continues to deny its citizens the right to basic amenities of life for socio-economic development.

Liberal-democracy in Nigeria is anti- people, anti-intellectual and anti-development. It has zero tolerances for criticism. Additionally, there is de-industrialization and de democratization. Liberal democracy in Nigeria has witnessed and still witnessing the cult of mediocrity. Our leaders, from Federal to the Local levels have failed to deliver the dividends of democratic governance to the Nigerians because they themselves do not possess the credentials of good leaders, nor do they seem to have due governance. A good number of them are ill – prepared or un-prepared for the challenges thrust on them by the electorate. Nigeria was and is still ruled by political

sycophantic lieutenants who are only concerned about their pockets alone. Such mediocre leaders lack the spiritual and political stamina to confront the socio-political upheavals that assail their people. Mediocre leaders also thrive on cheap popularity as a means of hiding their lack of definable ideology or agenda. They do not bear criticisms with equality; rather, they resort to witch-hunting and mudslinging to mask their ineptitude. The result of hoisting a mediocre leader in power is nothing but inefficiency, a decline in national productivity and under-development. It can also lead to social unrests (Machungo: 2001 ;).

Conclusion

The focus of the paper is to assess the practice of liberal democracy Vis – a Vis, its tenets under the Nigerian state. To do this, the paper is structured into 4 parts with introduction as part 1. Part 2 is conceptual and theoretical clarifications. Part 3 is tenets of liberal-democratic theory Vis-a Vis its practice in Nigeria. Part 4 is conclusion and recommendations. The paper concludes that; liberal democracy in the Nigeria state is characterized by problems of corruption, thieving, election rigging, ill – preparedness, destruction of necessary infrastructures that are needed for development, etc

Recommendations

Nigeria needs a democracy capable of guaranteeing maximum practice of freedom at its peak by the citizens without any fear of oppression, not only that, but also addressing the overwhelming material poverty of the people.

We need the type of democracy which promotes the equality of all the socio-linguistic groups irrespective of their sizes. Democracy must be viewed as a vital element of the humanitarian process. In this case, the way in which we should account to each other to express our human needs and thus achieve the full realization of the human task in the interest of our liberal democracy and the people is crucial.

We also need a democracy that ensures the practice of true capitalism; where the private sphere is free from state interference, and not a pseudo-capitalist kind of system that is prevalent and common.

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