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Conference Proceedings
BOOK OF FULL PAPERS

Editors
Assoc. Prof. M. Veysel Kaya
Dr. Patrycja Chodnicka-Jaworska


NOVOTEL Bangkok Sukhumvit 20
15-17 January 2019
Bangkok, THAILAND
10th RSEP International Multidisciplinary Conference
15-17 January 2019, NOVOTEL Bangkok Sukhumvit 20, Bangkok, Thailand

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Yargi Publishing House

Editors

M. Veysel Kaya
Patrycja Chodnicka - Jaworska

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KEYNOTE SPEAKER

Prof. Witsanu Attavanich
Kasetsart University, Thailand
Speech Title:
"Climate Change and Agriculture in Thailand"

“Special thanks to conference chair and keynote speaker”
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Ethnic Minority Mong Students Face Culture and Language Assimilation in the Lao PDR (People Democratic Republic) Educational System

Yer Jeff Thao
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thaoy@pdx.edu

Abstract

This article examines issues and challenges that Ethnic Minority Mong students encounter in the Lao PDR educational system. It points out that the Lao school curriculum does not have a meaningful cultural connection to Mong students and it needs to have pedagogical curricula by embracing with Mong students’ heritage language and cultural values. In order to help Mong students to acquire the necessary academic skills to succeed in the Lao educational system and onto the work force. The Lao education system needs to have an authentic multicultural education. Schools in Laos must have programs to support minority and Mong students to transition onto college life and provide them the educational opportunities to have equal access to all educational programs and onto the work Lao PDR force. Therefore, Lao PDR school needs social justice education.

Keywords: Southeast Asian Education, Social Justice Education, Minority Students, Mong Students, Multicultural Education

Introduction

Multicultural education is an educational strategy in which students’ cultures are used to develop effective classroom instruction and school environment. It supports and extends the concepts of culture, diversity, equality, social justice, and democracy into the school setting (Gollnick and Chinn, 2013, p.3).

Multicultural education has a very important role in the Lao higher educational system, --- specifically to give power to Mong students, so they can maintain a balanced sense of cultural and linguistic identity with the dominant Lao culture. Mong students have struggled to make a connection with Lao college and university curriculum that has been washed to remove their cultural identity. Increasingly, Mong students are being labeled as illiterate and tracked into lower level academic classes. Often, they are placed into remedial classes, advised to pursue vocational school which has limited their potential to get into graduate programs. Because of tracking into other low academic classes Mong high school students are not prepared for college, denying them an important opportunity to succeed in life. In addition, Mong students face discrimination when they try to enter college, graduate programs and/or to get employment. Colleges and employers use academic records only to determine who shall be accepted. Therefore, they view Mong students as lacking the academic skills to perform in college or to fulfill their employment responsibilities in reading and written communication. An American researcher Dr. Antonia Darder (1991) points out that through public education bicultural students are often mistakenly perceived as lacking the necessary intelligence and therefore they have diminished motivation to learn even if they were given the opportunities.

Lao educators in colleges and universities need to understand that children who are from minority backgrounds tend to have greater trouble with schooling because the types of curriculum found in the Lao PDR education system often have no representation of their lives as minority students. Yang (2008) concludes that the Mong in Laos fall behind the Lao and other ethnic groups in schools. This research clearly shows that the Mong students do not have equal access to school or but especially lack adequate culturally responsive curriculum support to help them succeed in Lao Schools. Lao education curriculum is exclusively based on the language and culture of Lao. This type of Lao biased curriculum too often does not succeed in teaching minority and Mong students to think critically in academic language, which is the basic expectation for Laotian monolingual and
monocultural students. Prapasapong (2009) makes a similar argument about the Thai educational system that Thailand has twenty-four languages but 92 percent of the population speaks Tai language. Thai public schools build on the cultural values of Tai speaking tradition and does not reflect the language, norms, rituals, symbols, skills, behaviors, beliefs, and values of the minority students in Thailand. The purpose of this article is to discuss the multicultural education learning discourse of ethnic minority Mong students in the Lao PDR educational system while living and adjusting to urban life. It also points out that classroom curriculum does not make meaningful cultural connections with Mong students.

Methodology

The researcher in this study used a qualitative research design to examine seven Mong college students in Laos about their experiences and perspectives of Lao PDR educational system and their transition to leave their rural village to live in urban city to go school. Creswell (2012) states that “A qualitative research design is commonly used to explain a situated activity; the researcher conducts interviews or engages in conversations because “a problem or issue needs to be explored” (p. 47). Therefore, the following open-ended questions were used to ask the Mong college students in Lao PDR in a face-to-face interview. Follow up phone calls were made to the students for additional clarification information. This study was conducted over a yearlong period which the researcher met the research participants in three separate occasions.

- Do you feel you have equal access to education compared to the dominant Lao students?
- What challenges you most as a Mong college student?
- Do you feel that your language and culture are welcome on campus?
- What kinds of adjustment and adaptation you have to make being a Mong student and go to school in an urban city?
- What suggestions do you have for the Mong students who plan to go college?
- Is there a Mong student organization on campus?
- Is there a Mong culture, language and history study or program at your college or university?

Participants:

There are four males and three females in this study. They study at three different college campuses: one university and two colleges. Pseudonyms are given for all colleges and the students to protect them from their government or personal consequences. See Table 1.
Table 1.

<table>
<thead>
<tr>
<th>Student Names</th>
<th>Gender/Year</th>
<th>University</th>
<th>DongDok College</th>
<th>Mekong College</th>
<th>Vientaine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seng Yang</td>
<td>Male, 4th Year</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bee Xiong</td>
<td>Female, 4th Year</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Tou Vue</td>
<td>Male, 2nd Year</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoua Hang</td>
<td>Female, 3rd Year</td>
<td></td>
<td></td>
<td>X</td>
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<tr>
<td>Yer Moua</td>
<td>Female, 3rd Year</td>
<td></td>
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<tr>
<td>Long Thao</td>
<td>Male, 3rd Year</td>
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<tr>
<td>Thai Vang</td>
<td>Male, 4th Year</td>
<td></td>
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</table>

Tou, Long and Thai came from Xieng Khouang province. Seng, Yer and Bee were from Vientiane Province. Shoua was from Laung Prabang Province. They are all first-generation college students in their family. They were from remote Mong villages. Tou, Long and Thai completed their secondary education in the city of Phonsavan. Yer completed her secondary education in the city of Vang Veing. Seng and Bee completed their secondary education in the city of LumXeng. Shoua completed her secondary in the city of Laung Prabang. Vientiane is the capital of Laos and is considered to be the largest city in Laos with a population over 3 million people. The entire population of Laos is close to 7 million people. http://countryeconomy.com/demography/population/laos. Mong students move into Vientiane City for college education. They have to relocate from the mountain and rural culture lifestyle into urban life and culture. This journey has become a major cultural transformation for the Mong and other ethnic minority students.

Lao PDR School System. The Lao PDR educational environments for minority students are geared toward the unified standard national Lao language curriculum, which lacks relevance to minority students. They find no sense of empowerment. Minority students spend a great deal of time studying proper Lao language grammar rules and reading materials to reinforce these grammar structures. This type of curriculum provides Mong students with very little motivation in learning, when the materials give them no encouragement to connect with their home culture’s stories. One consequence is relatively low scores on Lao based gateway tests like the Ordinary National Test (ONT). They are then labeled as language deficient and end up being placed in vocational school or dropping out of school altogether. All the seven students report that the ONT test was very difficult not only for the minority but also to the ethnic Lao students as well. This result corruption of the educational system. The wealthy parents pay the teachers and administrators to pass their sons and daughters. Often a student who got a passing score end up not passing because his/her score was replaced for a student that does not pass who is from a wealthy family.

The ideology of the Lao PDR educational system has been to educate students to read and write only in Lao, with the notion of assimilating minority students into the Lao standard national language and social life mainly reflecting a middle-class cultural tradition. For the most part the Lao PDR educational system has not encouraged students to maintain their home culture and language. Instead, it continues to dismantle students’ heritage and family values. Johnson (2007) points out that neighboring Thai public schools support the government’s goal, which is also to assimilate indigenous communities. Lao PDR’s assimilationist educational policy is governed by the Ministry of Education, which creates the guidelines handed down to schools in a similar practice as to the Thai educational system. All seven students do not remember studying Mong culture in their primary and secondary education as well as in college.

Schools in Laos continue to be a more difficult learning environment for minority students, and continue to disempower them. The Lao Ministry of Education’s National Language Policy forces minority students to divorce their heritage and family language by requiring schools to measure their educational outcomes with high-stakes Lao-based standardized tests. Without the incorporation of students’ culture and language into the curriculum in the public school, minority students will be singled out by high-stakes tests. Spring (2004) argues, “High-stakes standardized tests given in elementary, middle, and high schools represent only a single culture. Given to all students, test questions should not be based on knowledge known only to students in a majority
other dialects, or a dialectal language of intimacy (Delpit and Kilgour Dowdy, 2007). All seven Mong students expressed sadness of not being able to maintain their parents' tradition. The seven Mong students say that they have to relearn their parents' cultural tradition when they enter school. Johnson (2007) adds more that the Mong youth in Thailand are losing the culture and they are not able to understand their cultural identity by attending the Lao PDR educational system. The Mong students are confused and no longer can speak their own language and knowledge and skills. For example, the many ethnic Mong children tend to replace their parents’ culture and language with the Lao national language, knowledge and culture by attending the Lao PDR educational system. The Mong students are confused and no longer can speak in their parents’ language because they need to continue to practice speaking in standard Lao language at home so they can do well in school. This leaves little room for Mong students to learn and value their own culture and language at home. In this process the cultural identity of the home is devalued. Mong students have even changed their identity to Lao to avoid being labeled as minority or mistreated. Johnson (2007) argues that ethnic minority Mong students in Thailand assimilated to the Thai language and culture in Thai public schools the same way. All seven Mong students that participate in this study have Laotian names. They do not want to be identified as minority in school. They share that often school teachers and administrators as well as the school discriminate against minority students. They are not allowed to pass tests, promote grade levels, etc. and these seven Mong students do not want it to happen to them.

Based on Ogbu’s framework mentioned previously of the nature of Laotian schools, minority students place a high priority on the school culture and not on their home culture. Those students who are willing to make this adjustment will do well in school, but not do well in socializing with their home culture. Minority students who have difficulty accepted this change may become failures in their school, but maintain a strong social cultural root (Ogbu, 1987, 1990). Devine (1994) asserts, “Minority-group members who adjust to the dominant definition of literacy may suffer severe social and personal displacement; those who are unwilling or unable to make this adjustment may well suffer literacy failure” (p. 234). The students who accept the school culture bring that culture to their home culture and it overwhelms their home culture and creates conflict at home. Johnson (2007) adds more that the Mong youth in Thailand are losing the culture and they are not able to understand their parents’ tradition. The seven Mong students say that they have to relearn their parents’ cultural tradition when so they can do well in school. This leaves little room for Mong students to learn and value their own culture and language at home. In this process the cultural identity of the home is devalued. Mong students have even changed their identity to Lao to avoid being labeled as minority or mistreated. Johnson (2007) argues that ethnic minority Mong students in Thailand assimilated to the Thai language and culture in Thai public schools the same way. All seven Mong students that participate in this study have Laotian names. They do not want to be identified as minority in school. They share that often school teachers and administrators as well as the school discriminate against minority students. They are not allowed to pass tests, promote grade levels, etc. and these seven Mong students do not want it to happen to them.

Several American researchers in The Skin That We Speak, edited by Lisa Delpit and Joanne Kilgour Dowdy, pointed out the importance of adopting Ebonics language in the Oakland Unified School District, California, USA. These researchers argue that an individual should never feel a sense of inferiority, as often imparted by teachers, when using either formal English or a dialectal language of intimacy (Delpit and Kilgour Dowdy, 2002). In a similar fashion, Lao PDR schools should consider adopting a similar, Oakland−style language response model for minority students. If not, then Lao minority students such as the Mong would fall into John Ogbu’s (1987, 1990, 1991) “voluntary” vs. “involuntary” framework. He suggests that “voluntary” minority are those that seek for opportunities, willing to assimilate and adopt accepted, majority educational and professional skills. And “involuntary” minority students are those who may be educationally disadvantaged as they are more focused on adjustment and acculturation rather than assimilation into the culture. This was also true for the Mong students in Thailand (Johnson, 2007). All seven Mong students expressed sadness of not being able to connect to their home culture. Their schooling experiences are only about Laotian cultural values and social norms.

Mong-Laotian Students Face Culture and Language Assimilation. Traditional curriculum in the Laotian schools becomes a threatening force and a cultural invasion to the minority students. Often minority students directly apply what they learn in school to their everyday home life. For example, the many ethnic Mong tribal children tend to replace their parents’ culture and language with the Lao national language, knowledge and culture by attending the Lao PDR educational system. The Mong students are confused and no longer can speak in their parents’ language because they need to continue to practice speaking in standard Lao language at home so they can do well in school. This leaves little room for Mong students to learn and value their own culture and language at home. In this process the cultural identity of the home is devalued. Mong students have even changed their identity to Lao to avoid being labeled as minority or mistreated. Johnson (2007) argues that ethnic minority Mong students in Thailand assimilated to the Thai language and culture in Thai public schools the same way. All seven Mong students that participate in this study have Laotian names. They do not want to be identified as minority in school. They share that often school teachers and administrators as well as the school discriminate against minority students. They are not allowed to pass tests, promote grade levels, etc. and these seven Mong students do not want it to happen to them.

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they go home during the time school is off session. Four of the seven Mong students state that they even go with their parents to the farm plantation to learn farming skills.

Thao (2003) study with the Mong children in the United States reveals that the culture of school suddenly empowered the Mong students to challenge their parents’ authority at home. Mong children give less respect to their parents and their cultural values because of what these Mong students gained from school. This study concluded that in order to empower the Mong students both the teachers and Mong parents must work collaboratively with one another (Thao, 2003). Lao PDR school parents have very little parental involvement. Parents view teachers and administrators as the expert and have great respect for them. Therefore, parents would rather not get involved in their children’s school because they do not to want teachers and administrators to think and feel disrespectful.

**Academic Programs and Strategies to Empower Mong Students in Lao PDR Schools.** The curriculum in Lao schools need to have a connection with minority students. To encourage and promote the identity, culture and language of minority students thereby enhancing respect for all students. A multicultural education curriculum can creatively bridge the gap between students’ home cultures and the dominant school culture. Students are more interested to learn in any classroom where curriculum materials relate directly to students’ backgrounds (Grant and Sleeter, 1998). This way, the curriculum content would not be a threat to the students. For example, Delgado-Gaitan (1990) argues that the content of literacy in and out school can be understood within the concept of cultural empowerment. Schools must provide literacy programs that allow minority parents to teach children and their teachers their native culture and primary language, thus empowering them to have deeper knowledge of literacy, and of the reality of both cultures. In my early career as an elementary school teacher in a public school in US, I had an after-school Mong literacy program to teach Mong history, stories, folktales, legends, reading and writing to Mong children (Thao, 2003). It was a very effective program. Many Mong children did very well in school and in the after-school program. The program empowered Mong parents and children to learn Mong and English literacy together. Freire and Macedo (1987) argue that an effective literacy program should be based on the rationale rooted in the students’ culture as well as their native language. They stated, “The failure to base a literacy program on the native language means that oppositional forces can neutralize the efforts of educators and political leaders to achieve decolonization of mind” (p. 151).

Programs in which students learn to accommodate others’ cultures and languages are most effective. The Parajo Valley Family Literacy Project in Watsonville, California, USA was an excellent model (Ada, 1988; Cummins, 1996). This family literacy project had a tremendous impact on the school district, teachers, and the Hispanic community. Most families were migrant farm workers. This project created an open space and welcoming environment in the school for Hispanic parents to be part of their children’s literacy education. The children of the Hispanic families that participated in the project made a big improvement in their literacy skills and stayed in school (Ada, 1988; Delgado-Gaitan, 1990, 1994; Cummins, 1996; BEOutreach, 1992).

Lao PDR traditional education system causes many hardships for minority students especially for the Mong ethnic group. Siribodhi (2014) states in her report from investigation how minority students experience in Thai schools saying, “Basic Education Curriculum in Thailand: Content and Reform” calls for the Thai school curriculum to be relevant for local wisdom and knowledge. This type of school reform in Thailand will empower individual Thai minority students. Also, it will help Thai minority students to make connections from their culture to the cultural curriculum in which teachers taught them and vice versa. Therefore, Lao PDR schools should consider making a change of school culture to accommodate all Lao minority students. All seven Mong students strongly agree that schools should be more respectful toward minority students and their culture especially teachers, administrators, and native Lao speaking students.
Conclusion

This study will help educators to better understand the schizophrenia of the worldviews that Mong-Laotian college students have as they venture through Lao PDR educational system. Lisa Delpit (1988) reminded us that there are different codes in different settings children learn to know. The code of language and culture of Mong students can be different from the Mong villages and the cities. Therefore, Mong students have to code switch back and forth between the rural Mong culture to the urban and Laotian culture.

The seven Mong college students testify that they are assimilating into the national language and social life of Lao lifestyle, social class and culture norms. It is a growing concern that causes a large number of Mong students to drop out of school. Many Mong students no longer have a viable identity. Furthermore, they are having trouble meeting the standard requirements for graduation or successfully passing the entrance exam in school because they are being viewed in Lao society as a minority. It is time for the Lao PDR educational system to consider social justice education. It provides multicultural and multilingual education as part of the school’s curriculum. This way, Mong and other minority students will be learning material that makes sense to them and they will be motivated to study, so they can graduate from college, go on to graduate schools and obtain a better paying job rather than being denied for jobs due to their lacking the skills recognized by a dominant Lao culture.

This approach will arguably enrich and reinvest the tremendous “cultural capital” of Laos. Multicultural education will motivate minority students to do well in school. If the Lao PDR educational system does not have an appropriate multicultural curriculum to teach to the Mong and other minority students, then the teaching content is no longer an interesting and relevant subject for students. Therefore, minority students will continue to feel that schools do not prepare them to be a respected minority member of mainstream Laotian society. Often, colleges and universities do not meet the needs of minority students, to help them maintain the balance between their home and school cultures. The minority students mostly will be brain-washed into thinking that the Lao national language and middle-class social life has the most value. They will no longer know their own cultures, languages, and histories. Most minority students will no longer feel they have a solid and respected identity. Their identity will be lost, ignored, or taken away from them during the time they pass through the Thai public educational system as well. Social justice education should be the foundation to help minority students to have a strong relationship between home and school cultural values.

The Lao education curriculum needs to include students’ native languages, cultures, and history. This way Lao PDR would have effective academic programs to teach minority students to become bilingual and biculturally literate. Therefore, Laos will have future educators that support the country for global culture, tourism and ecological exchanges. A study in Thailand which is a neighboring country of Laos by Sihragool, Petcharugsa & Chouenon (2009) state that the bilingual Pwo-Karen education in Omkoi District, Chiangmai Province is very productive because the school curriculum was developed to include the cultural themes and language of the Pwo-Karen community. This is very true about multicultural education because it is the first step to give Thai minority students to have a respected voice, learn their own cultural and language values rather than learn someone else’s values. It provides them the right tools to make changes in this society and create an identity sensitive to changes demanded by acculturation.

Therefore, I urge that Lao Ministry of Education, colleges and universities, secondary and primary schools, professors, educators, teachers, and administrators, as part of the educational institution, to advocate for
multicultural and multilingual education as a vital part of higher education’s pedagogy curriculum. In order for minority students to succeed on college graduation or post graduate school examinations that are demanded by the Lao Ministry of Education, Colleges and Universities, and the Lao society, the pedagogical content of Lao education must acknowledge these students and their culture. The school curriculum that focuses on students’ heritage makes sense in their learning and this will raise both student self-esteem and achievement on national college-mandated tests. We must incorporate multicultural and multilingual curricula in all colleges and universities to prepare all students to create a growing and diverse Lao society. This recommendation concurred with a remark made by United States of America’s President, Barack Obama during his visited Laos in 2016, stated: “Diversity is the strength of Laos nation. You have Lao and Khmu and Hmong and a tapestry of proud ethnic groups and indigenous people… the people of Laos to respect for all cultures and religious” (September 16, 2016 at 2:04 P.M. in Vientiane, Laos at the Lao National Cultural Hall). Therefore, if Lao PDR education embrace the guide values that president Obama offered then the future of Lao educational system will create an opportunity for all students to have access to their educational equity.

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Abstract
The aim of this study is to explore how to reduce stress among bank employees using the Story of Mahajanaka. The Story of Mahajanaka is a tale of Theravada Buddhism that tells of the final lives of the Bodhisattva. The translation used in this research was prepared by King Bhumibol Adulyadej and serves as a folkloric expression of the King’s philosophy of sufficiency economy. This research uses a primary intervention strategy of self-study of Story of Mahajanaka as a philosophy tool to improve cognitive coping and problem-solving skills. The 10-week intervention included 100 bank employees, 50 in the experimental group and 50 in the control group. A pre-test was conducted to evaluate stress levels in four categories (role conflict, role ambiguity, role overload, and role characteristics), as well as physical and mental well-being effects. The intervention included a one-hour presentation of the animated film of the Story of Mahajanaka, discussion of how to use the text as a mindful reflection tool to reduce stress, and provision of a copy of the book to each participant. Participants were given ten weeks to read Mahajanaka Story and implement its effects. A post-test was then conducted. The analysis showed that during the pre-intervention period, there was no difference between the two groups. However, in the post-intervention period the group that had Mahajanaka Story had significantly lowered stress perceptions and fewer physical and mental symptoms. The implication of this research is the Story of Mahajanaka can be used as an effective primary intervention tool for individual stress interventions in Thai organizations.

Keywords: Organizational stress, Mahajanaka Story

Introduction

Statement of the Research Problem

The problem this research addresses is how to design a relevant, meaningful primary stress intervention for a Thai organization that can improve coping and reduce stress reactions in employees. The chosen organization is a domestic bank in Thailand which is in the process of implementing an organization-wide primary stress intervention for its employees after employee surveys identified high levels of job stress and stress responses across the organization. However, it is not clear from the literature which strategies would be best from the organization. While there have been a few studies that have focused on Thai contexts, these have not had very strong effects (Bennett, et al., 2016; Charoensukmongkol, 2013; Charoensukmongkol, 2014). Of these studies, Charoensukmongkol (2013, 2014) has been the most successful at identifying effective stress management techniques with his research into mindfulness meditation, providing some guidance on what kinds of strategies could be successful, but did not fully explain its use as an organizational intervention. The problem of lack of research into Thai organizational contexts is not limited to this bank. In fact, there is a general lack of research into workplace stress in non-Western contexts, despite known cross-cultural differences in both lay representations of workplace stress and the relationship of stress and job outcomes (Idris, Dollard, & Winefield, 2010; Wong, Teo, & Cheung, 2010). Thus, even though it was clear that there may be approaches that were more consistent with Thai organizational contexts and cultural preferences, it was not clear what these strategies were. Therefore, the selection of a philosophical text that was consistent with the organization’s goals and with
individual preferences for philosophy was critical. This meant that the research was mainly concerned with how to choose a text that would be effective for a primary intervention.

Research Aim and Objectives

The aim of this study is to explore how to reduce stress among bank employees using the story of Mahajanaka. There are 4 objectives which are:

1. To measure the level of work stress from intrinsic job itself and role stressor before and after reading and use the Story of Mahajanaka in bank employees in Bangkok;
2. To study and investigate the working ideas behind the Story of Mahajanaka and apply them as a work stress coping mechanism;
3. To investigate the difference in the level of job stress between demographic groups before reading the Story of Mahajanaka; and
4. To investigate the difference in the level of job stress between work experience groups before reading the Story of Mahajanaka.

The research questions of the study are as follows:

1) Are there significant differences in the levels of work stress between control group and experimental group before introducing the Story of Mahajanaka?
2) Are there significant differences in the levels of work stress between different demographic group?
3) Does use of the Story of Mahajanaka affect stress perceptions and mental and physical well-being?

Research Hypotheses

H1: There is a significant difference in job stress levels between different demographic groups (age, gender, years of work experience, work position).

H2: There is no significant difference in job stress levels between control group and experimental group before introducing Mahajanaka story.

H3: There is a significant difference in the levels of job stress between group of Mahajanaka users and Mahajanaka non-users.

Scope of the Research

This research was conducted at the individual employee level. The study is longitudinal, with data collected in two time periods separated by 10 weeks in August 7, 2018 to October 18, 2018, during which an organizational intervention was implemented. The research took place in a Thailand’s domestic banks. The study included 100 employees of this research bank at all levels, who were divided into control and experimental groups. The study used a pre-test/post-test strategy, with data collected in Week 1 and Week 10 of the intervention. During Weeks 1 to 10, the intervention (including workshop and self-guided study) was implemented. The intervention was designed as a primary intervention and open to all employees, regardless of stress levels. The intervention used the Story of Mahajanaka as a self-guided text for mindfulness and philosophical contemplation to encourage development of cognitive and proactive coping strategies and application of these strategies to work.

There are several limitations to the scope of the research. These limitations include the cultural and institutional context, as the intervention was designed specifically for this research bank and its organizational needs and environment. Thus, the intervention may not be as successful in other organizations. The study is also mainly concerned with personal mental and physical well-being rather than organizational outcomes, since these outcomes are more relevant to the individual employee and their experience at work. Although the intervention design was specific to this research bank, the findings still provide insight into the use of the Story of Mahajanaka as an intervention tool.

Definition of Terms
Coping. Individual cognitive, emotional, and behavioral strategies to manage the response to stress and uncertainty that exceeds the individual’s resources (Boyd, Lewin, & Sager, 2009). There are multiple coping strategies recognized, which either remove sources of stress or mitigate the effects of stress on the individual’s well-being.

Intervention. An organizational tool designed to reduce job stress in the organization by teaching individual coping techniques, ameliorating the effects of stress, and/or changing organizational conditions to reduce or eliminate stressors (Tetrick & Winslow, 2015).

Role ambiguity. Job stressors resulting from uncertainty about what the role entails, including unclear responsibilities and expectations, supervision and lines of authority, policies and procedures, and tasks and goals (Michie, 2002; Schmidt, et al., 2014; Sonnentag & Friese, 2003).

Role characteristics. Intrinsic characteristics of the role which can create stress, such as dangerous, complex, or physically demanding tasks, tasks with high responsibility and dependence, or conditions such as autonomy and interest (Michie, 2002; Schmidt, et al., 2014; Sonnentag & Friese, 2003).

Role conflict. Job stressors resulting from conflicting demands from different aspects of one’s role, including work-home conflict, ethical conflicts, supervisory conflicts, and conflicts between different policies or policies and practice (Michie, 2002; Schmidt, et al., 2014; Sonnentag & Friese, 2003).

Role overload. Job stressors resulting from mismatch between role demands and resources, such as long working hours, too much work, and too few resources (Michie, 2002; Schmidt, et al., 2014; Sonnentag & Friese, 2003).

Stress. A psychological and physical state resulting from unpredictable or uncontrollable demands and pressures that the individual does not have the resources to manage (Koolhaas, et al., 2011; Michie, 2002). Stress serves as an adaptive response when individuals face unexpected challenges, but when stress is chronic or extreme it is maladaptive (Bickford, 2005; Carr, Kelley, Keaton, & Albrecht, 2011).

Stressor. A condition or occurrence that causes a stress response (Sonnentag & Frese, 2003).


Workplace stress. “...change in one’s physical or mental state in response to workplaces that pose an appraised challenge or threat to the employee (Colligan & Higgins, 2005, p. 89).”

The Story of Mahajanaka. A philosophical narrative derived from the Mahānipata Jākata scripture of Theravada Buddhism, detailing the story of Prince Mahajanaka (the Lost Prince) (Appleton, 2010). The tale’s translation by His Majesty King Bhumibol Adulyadej is recognized as a seminal work detailing the King’s philosophy of the sufficiency economy, and has been translated and represented in an animated film (Kosaiyakanont, 2014; Potchanakaew, 2018).

Literature Review

The Concept of Stress

Definitions and models of stress
This research relies on the person-environment fit model, which argues that stress results from a perceived inconsistency between the demands of the environment (the organization, job and role) and the individual’s resources (Bickford, 2005). This model addresses the main stressors in the workplace that are relevant to this study, as discussed below.
2.2 Stress in the Workplace

Key issues include in workplace stress sources and effects of workplace stress, workplace in specific contexts relevant to this study (the banking workplace and in Thailand), and measuring workplace stress.

Stress in the Banking Workplace

The banking workplace can be characterized as a high-stress environment, with a high level of role conflict and role ambiguity along with individual stress factors. This results in high reporting rates of psychological and physical stress symptoms.

Measuring Workplace Stress

There was no single instrument that could be used to measure stress effectively, the decision was made to adapt items from the literature review but not to apply a single instrument.

2.3 Individual Factors Influencing Workplace Stress

Although job roles and work characteristics may have the most influence on workplace stress, there are also individual characteristics that could play a role. The four key factors identified through the literature review include age, gender, work position and years or work or seniority.

Age

Several previous studies have identified age as a potential factor in the stress levels faced by individual workers, most predicting that older workers will experience more stress in the workplace. There is evidence for age and generational differences that could influence workplace stress.

Gender

Gender has also been widely studied as a potential factor in workplace stress. In many workplaces, women are subject to conditions that do not affect men, such as individual and institutional sexism and discrimination (Bond, Punnett, Pyle, Cazeca, & Cooperman, 2004; Page, et al., 2013) A cross-cultural study of managers from the United Kingdom, United States, Taiwan and South Africa showed that these effects were mostly stable between countries, indicating that this is a cross-cultural issue (Miller, et al., 2000). Thus, it is likely that this would occur in a Thai population.

Work Position

Thus, there is evidence that employees with more responsibility, such as managers, or whose roles are conflicting or otherwise inherently stressful, are likely to experience more stress than others.

Years of Work (Seniority)

The final characteristic is years of work in the position (or seniority). This is one of the least investigated role characteristics, but a few studies have addressed it. Thus, even though this area is less strong than others, there is still evidence that seniority affects stress.

Managing Workplace Stress: Personal and Organizational Tools

Tools for managing workplace stress are typically discussed in the literature at two levels: personal coping strategies and organizational interventions.

Personal coping

Coping refers to the person’s ability to manage their responses to stress and uncertainty (Boyd, Lewin, & Sager, 2009). Boyd, et al. (2009, p. 199) defined the coping strategy as “cognitive and behavioral efforts to manage specific stressors that are assessed as taxing or exceeding the resources of an individual, and are perceived as potentially leading to negative responses.” There are several different coping strategies or styles that can be identified. Boyd, et al. (2009) identified cognitive coping styles, or problem-solving strategies, and emotional or escape styles, which are used to mitigate emotional harm. Thus, choice of a poor coping strategy can exacerbate the effects of a stressor rather than reduce it. Another author also found that social support active coping strategies moderated the effect of job stressors on physical and mental well-being, while avoidance coping exacerbated these symptoms (Snow, et al., 2003). Furthermore, individuals do not necessarily have good coping
strategies on their own, and may use negative coping strategies as stop-gaps without more information about stress and coping (Pipe, et al., 2011). This raises the question of how organizations can help their employees cope effectively with stress. The most common response to this question is implementation of an organizational intervention for stress management.

Organizational intervention
An organizational intervention is an organizational strategy used to help reduce stress and/or help employees manage stress (Tetrick & Winslow, 2015). Tetrick and Winslow (2015) identify three different levels of intervention. The primary intervention, which is directed to all employees, is “proactive and prevention oriented (Tetrick & Winslow, 2015, p. 16.3).” The secondary intervention, which focuses on employees that are known to be at risk, is intended to either eliminate stressors or teach specific coping skills. Finally, the tertiary intervention is a recovery intervention, aimed at employees who have been exposed to stressors to help them recover (Tetrick & Winslow, 2015).

The Cultural Specificity of Stress and Coping
One concern with adapting the interventions reviewed here is that they were mainly used in Western organizations, and as discussed below may not be effective in a Thai organization. Therefore, this study contributes to understanding of questions like whether workplace stress is culturally contextual.

The Story of Mahajanaka As a Workplace Stress Intervention
This research used the Story of Mahajanaka as a tool for developing resiliency and coping strategies as the basis of the workplace intervention. Although this has not been attempted previously as far as the researcher could determine, the story and its underlying meaning were identified as consistent with other texts used in organizational interventions for workplace stress.

The Story of Mahajanaka is one of the tales contained within the Mahanipata Jākata, or the Ten Great Birth Stories of the Buddha (Appleton, 2010). The Mahanipata Jākata represents the most popular of the jākata tales, which tell the stories of the final acts of the Bodhisattva. The Mahanipata Jākata, which derive from Theravada Buddhism, have particular importance in Thai Buddhism, and are often depicted in Thai temples and religious artwork (Appleton, 2010). In this story, Prince Mahajanaka sails for Suvarnabhumi to retake his father’s kingdom. The ship encounters a storm and sinks, leaving Prince Mahajanaka afloat in the sea. However, Mahajanaka remains calm and eats as much as he can to prepare for a long and uncertain journey. After a week afloat in the sea, the ocean goddess Manimekhala recognizes the floating prince and rescues him.

The Story of Mahajanaka has religious importance, but it also has high cultural importance. The seminal translation of the work was prepared by His Majesty King Bhumibol Adulyadej, and was released in 1996 (Kosaiyakanont, 2014). This translation extends the original story and applies the King’s modern-day sufficiency economics philosophy of perseverance and resilience to the traditional story. The King’s translation also uses a simple choice of words and uses non-verbal communication in the form of text illustrations to communicate about the meaning of the text (Kosaiyakanont, 2014). Thus, the Story of Mahajanaka text used in this intervention is more complex than the relatively short and straightforward retelling of the tale of Mahajanaka as offered in traditional Theravada scripture. The text has also been transformed into an animated film, which communicates about the values of perseverance as well as environmental conservation and ancestral wisdom inherent in the text (Potchanakaew, 2018). The Story of Mahajanaka has been recognized as one of the influences in ecological and conservation ethics in Thailand (Vivian & Chatelier, 2015). Thus, it is known that it has had society-wide impact. This study investigates how individuals can use the Story of Mahajanaka to learn resilience and coping strategies. Within the study, the Story of Mahajanaka is used as a primary intervention strategy, aimed at all employees and designed to teach coping skills in case of risk exposure (Tetrick & Winslow, 2015). This approach was chosen because primary intervention strategies are known to be most effective at proactively reducing stress and its effects (Godfrey, et al., 1990).

Conceptual Framework
The conceptual framework of the paper (Figure 1) is mainly concerned with the effect of individual differences in the experience of stress and the effect of the *Story of Mahajanaka* on the experience of stress. The conceptual framework proposes three hypotheses.

The first hypothesis relates to the effect of demographic and work characteristics on the experience of job stress. As the studies reviewed in Section 2.3 explained, workers at different ages or of different genders, and who hold different positions and levels of seniority, are subject to different stressors and may perceive these stressors differently. Therefore, the experience of stress for workers in these different demographic and work categories is likely to be different, including both perceptions of stress and the effects of stress such as physical and mental effects. Therefore, the first hypothesis is:

**Hypothesis 1**: There are significant differences between demographic and work groups for work stress and effects.

The second and third hypothesis relates to the *Story of Mahajanaka* and its potential use as an organizational intervention to develop coping skills and resilience. It is anticipated that prior to the introduction of the *Story of Mahajanaka* during the planned intervention, workers in the organization will experience the same level of stress and same symptoms of stress regardless of whether they are assigned to the control group or the experimental group. This hypothesis is stated as follows:

There are no significant differences in job stress levels between the control group and experimental group before introducing Mahajanaka story.

Based on the literature on organizational interventions (Section 2.4), it is also anticipated that the individuals assigned to the experimental group, who receive the planned intervention, will experience reduced stress levels and stress symptoms compared to those that did not take part in the intervention. (The experimental design and the planned intervention is discussed in the next chapter.) This hypothesis is based on the literature on stress and coping, which is presented above. It is stated as:

There is a significant difference in the levels of job stress between groups of Mahajanaka users (experimental group) and Mahajanaka non-users (control group).

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**Research Methodology**

This chapter explains the research methodology selected for the study. The research methodology is the set of both broad principles and specific techniques chosen for the primary research, which are selected in response to the research questions and issues addressed (Weathington, Cunningham, & Pittenger, 2010). This research uses a quasi-experimental strategy, with quantitative analysis including pre-test/post-test comparisons and between-

![Figure 1 Conceptual framework of the paper](image-url)
groups comparisons for a control group and experimental group. The chapter begins by explaining the research strategy and methods used. It then addresses the target population and sampling procedures. This is followed by description of the experimental process and explanation of how the research instruments were designed and used. The data analysis technique was then described. The chapter concludes with a summary of the ethical issues and limitations of the study.

Research Method

This research deploys a quantitative method, based on post-positivist philosophy and a deductive research approach. Quantitative research can be described as “a means for testing objective theories by examining the relationship between variables. These variables can be measured, typically on instruments so that numbered data can be analyzed using statistical procedures (Creswell & Creswell, 2017).” The choice of quantitative research rather than qualitative research was made because the objectives of the research are to investigate the effect of the Mahajanaka as a stress coping tool in a wide population. Thus, qualitative research, which investigates specific experiences, would not be as effective.

Quantitative research is typically undertaken with a positivist or post-positivist philosophical perspective, which argues that reality is concrete and objective and can be measured using standard instruments (Grix, 2018). This research uses post-positivism, which acknowledges that reality is concrete and can be discovered using standard techniques (the positivist positions on ontology and epistemology), but softens the position that research is value-neutral and that the researcher’s position does not matter (its axiology) (Grix, 2018). The post-positivist viewpoint is more consistent with the needs of the current research because the study is concerned with human perceptions and values, and therefore must take these issues into account.

Finally, the study uses a deductive approach. In this approach, the researcher establishes a theoretical framework based in existing knowledge and then applies the theoretical framework to new observations to see if it matches (Trochim, Donnelly, & Arora, 2016). The deductive approach was selected because the goal was to take the first step in investigating the Mahajanaka as a coping tool under existing theories of stress and coping, rather than to develop new theories without considering whether existing theory was sufficient.

Research Design

There are a limited number of research designs that are commonly used in quantitative research, which can be divided into surveys and experiments (Creswell & Creswell, 2017). While ordinarily surveys are easier to undertake in organizational research and other social settings (Jones, 2014), in this research there was an opportunity to use a quasi-experimental design.

Full experimental designs are difficult to perform in social situations, because of the complexity of social environment and uncontrolled external conditions (Creswell & Creswell, 2017). However, a quasi-experimental design, in which some aspects of the participants’ experience is controlled, is possible in social and organizational research (Thyer, 2012). For example, a quasi-experimental research design may compare pre-test and post-test responses between experimental groups (where the experimental intervention is offered) and control groups (where the intervention is not offered), but not attempt to control for external factors such as group makeup or contact with external environmental factors (Thyer, 2012). The quasi-experimental approach does not deliver results that are quite as reliable as a full experiment, but is a strong compromise for social research situations where the use of a full experiment is not possible (Trochim, et al., 2016).

The quasi-experimental design was selected because it is superior to survey research for understanding how specific factors influence stress and other concerns. For example, in this research, the researcher was investigating the effect of a specific coping strategy (use of the Mahajanaka) as a tool for managing stress in the workplace. Because this is not a tool most people have encountered for stress management previously, it would not be sufficient to simply use a survey. Furthermore, using a pre-test/post-test comparison without a control group would not allow for the researcher to determine whether changes had occurred other than the use of the Mahajanaka. Thus, the quasi-experimental design was the best choice for this study.
Target Population and Sampling Procedure

Research Site and Target Population
The research was conducted in a single organization, this research bank is a large Thai domestic bank. This research bank has an existing stress and coping program which employees can enroll in voluntarily to learn about managing work stress. For the purposes of this study, all of this research bank’s employees were considered as potential participants.

Sampling and Group Assignment

G*Power 3 was used to determine a priori sample size for the research. G*Power is a power analysis tool that is used to compute sample sizes and statistical power of completed tests (Buchner, Erdfelder, Faul, & Lang, 2018). Parameters included medium effects size (0.5), confidence interval (±5%) and confidence level (95%). Slightly different minimum sample sizes were found for the three key tests identified, including independent t-test for difference in means between two groups (n = 70), t-test for difference in dependent means for pre-test/post-test evaluation (n= 45), and one-way ANOVA for means comparison between three or more groups (n = 80). To ensure that the sample size was adequate for the study, a sample size of n = 100 respondents was selected.

The sample was selected using simple random sampling from the employee database at this research bank. Simple random sampling was chosen to ensure that the sample would be representative (Trochim, et al., 2016), and demographic information was collected to ensure that the sample was balanced. Respondents were solicited via email through the company’s email system. A screening question was used to make sure that respondents had not read the *Mahajanaka* previously. Following the initial recruitment, a second random selection was made and the second group was solicited. This process continued until there were 100 positive responses.

Following sample selection, respondents were randomly assigned to the Experimental Group (EG) or the Control Group (CG), with each group consisting of 50 members. EG members were subjected to the experimental intervention (below), while CG members followed the standard stress and coping training.

Experimental Process

The experimental process used a pre-test/post-test design, to compare outcomes not just between groups, but also between members of the same group. This was intended to ensure that the experimental intervention not only improved stress management, but improved it more than the control group. Figure 2 shows the experimental process.

The experiment was conducted over a period of 10 weeks. In Week 1, a questionnaire-based survey (which is attached in the Appendix and described in detail in the next section) was used to collect data on stress and its effects, as well as demographic information, from all participants in the CG and EG groups prior to the implementation of the experimental intervention. The intervention for the EG began with a 1.5 hour workshop (conducted in two groups) that addressed how to use the *Mahajanaka* as a stress management tool. Participants in the EG were then given the book and asked to work on their own for a period of 8 weeks. The participants in the CG had access to the standard this research bank resources on stress and coping, including online tools and information guides, but were not involved in the workshop or in self-study of the *Mahajanaka*. In Week 10, the questionnaire-based survey was repeated, with the same information collected as previously. (Demographic information was not collected a second time as the respondents had previously provided the information.)
Research Instruments

Experimental Intervention

The experimental intervention was offered to the EG (n = 50). The first stage of the intervention consisted of a workshop, which lasted approximately 1.5 hours. These workshops were offered in two stages in the first week of training, with each participant assigned to a random workshop. The first hour of the workshop was a Mahajanaka film, which introduced the story and its context. In the remaining half hour, the researcher summarized the film and discussed how to apply the principles to work-life balance and stress issues. A copy of the Mahajanaka book was provided to each of the participants and they were asked to read and study the book and apply lessons over the next ten weeks.

Questionnaire

The questionnaire was distributed to all EG and CG members prior to the workshop intervention (Week 1) and at the close of the study (Week 10). The questionnaire was developed using the literature review as a guideline, but was not adapted from a single questionnaire. Instead, the questions were developed based on the specific characteristics of the organization, to ensure that it was relevant to the work experience of the respondents (Saris & Gallhofer, 2014). The first part of the questionnaire collected general information using unidimensional categorical items. The second part of the questionnaire collected attitude and perceptual information using 5-point Likert scales. Likert scales were selected because they are the most useful tool for measuring attitudes, which cannot be measured precisely (Saris & Gallhofer, 2014). Seven items each were used to measure level of stress from role conflict, role ambiguity, role overload, and job characteristics. Nine items were used to measure symptoms from all work-related stressors.

Validity and Reliability Testing

The questionnaire was evaluated for validity using face validity testing with the researcher’s supervisor. This approach was chosen because the sample was too small to use more intensive approaches such as principal component analysis, which may be used for development and testing of instruments that require high rigor, such as psychological testing instruments (Cross, 2016).
Coefficient alpha was used to test internal reliability of the Likert items. Alpha is a generalization of the KR-20 test for internal consistency of Likert items, applying to scales with three or more items rather than only two items (Cho, 2016). In general, alpha coefficients of 0.7 to 0.8 can be considered acceptable, while 0.8 to 0.9 is considered good and 0.9 is considered excellent (DeVellis, 2012). The alpha test was conducted in SPSS, using the first 20 questionnaires (10 from each group) collected. Results are shown in Table 3. As this shows, all the multi-item Likert scales reached the level of at least .711, indicating that all scales have at least an acceptable level of internal reliability. Therefore, all the scales were accepted as specified.

Data analysis was conducted in SPSS, which was selected because of its reliability and flexibility in terms of the tests it can perform (Pallant, 2016). The first stage of analysis was descriptive analysis for both the pre-test and post-test outcomes. For the demographic information, frequency distributions were prepared, which demonstrate the distribution of characteristics in the population (Warne, 2018). For the Likert items, means and standard deviations were calculated, which demonstrate the central tendency and distribution around the mean of the responses in the sample (Warne, 2018). While other approaches for Likert items can be used (Saris & Gallhofer, 2014), in this case mean and standard deviation were appropriate because of the intended inferential analysis approach.

Inferential analysis was conducted to test the hypotheses. Inferential tests were selected based on the type of data and the intended information to be derived from the test. Table 4 summarizes the hypotheses that were tested and the choice of measures. The main inferential techniques used include one-way ANOVA and independent samples t-tests.

Table 1: Data analysis tools and strategies

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Analysis tool</th>
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<tbody>
<tr>
<td>H1: There is a significant difference in job stress levels between different demographic group (age, gender, years of work experience, work position)</td>
<td></td>
</tr>
<tr>
<td>- H1_a: There is a significant difference in job stress levels among age groups.</td>
<td>One way ANOVA</td>
</tr>
<tr>
<td>- H1_b: There is a significant difference in job stress levels between male and female employees</td>
<td>Independent sample t-test</td>
</tr>
<tr>
<td>- H1_c: There is a significant difference in job stress levels among work positions.</td>
<td>One way ANOVA</td>
</tr>
<tr>
<td>- H1_d: There is a significant difference in job stress levels between different years of work experience.</td>
<td>One way ANOVA</td>
</tr>
<tr>
<td>H2: There are no significant difference in job stress levels between control group and experimental group before introducing Mahajanaka story.</td>
<td>Independent sample t-test</td>
</tr>
<tr>
<td>H3: There are a significant difference in the levels of job stress between group of Mahajanaka users and Mahajanaka non-users</td>
<td>Independent sample t-test</td>
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</tbody>
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The independent samples t-test compares mean differences between two different (independent) groups, to determine whether the mean difference is statistically significant (Warne, 2018). This approach was used for H1_2 (gender differences in job stress), H2 (differences in pre-test stress) and H3 (differences in post-test stress). One-way ANOVA is a generalization of the independent t-test for difference in means, which tests for significant mean differences between three or more groups (Warne, 2018). This test was used for H1_1 (age differences in job stress), H1_3 (work position differences in job stress), and H1_4 (tenure differences in job stress). For all inferential tests conducted, significant mean differences were accepted at a standard level of p < .05 (Warne, 2018).
Ethical Issues

The main ethical issues in this research included consent and confidentiality. Fully informed consent is required for any research that involves humans, to make sure that the participants fully understand what they are providing and why the study is being conducted (Oliver, 2010). To ensure that the respondents were informed, the researcher included a detailed description of the reasons for the research and how it was being conducted, along with contact information, in the pre-test questionnaire consent process.

Confidentiality was also important because of the organizational context of the study, which could lead to harm if the responses were not kept confidential or if data were accidentally disclosed (Oliver, 2010). Although this research did not touch directly on work performance, its disclosure could potentially be harmful. The research could not be completely anonymous because of the need for random sampling and the requirement to compare the pre-test and post-test responses. However, unnecessarily personally identifying information was not collected from respondents at any time. For example, detailed information about job positions like department or job role title was not collected. Personal names and other data also were not associated with responses. Instead, respondents were issued a participant number to quote in the questionnaire, which helped to associate the pre-test and post-test results. The researcher did collect names of respondents for validation purposes, but this information is not associated with questionnaire results and will not be released. Identifying data and other raw data will be destroyed on completion and acceptance of the study.

Results

Participant Profile

Participant demographic and workplace characteristics (Table 5) were collected both to check that the sample included members of different groups (though it is not, nor is it designed to be, representative) and because the tests of Hypothesis 1 (parts 1 through 4) were based on these characteristics.

Gender. There were 23 male participants and 27 female participants in the EG. In the CG, there were 25 male participants and 25 female participants. Thus, the distribution of participants by gender is approximately equal in both groups and there are similar numbers of male and female participants overall.

Age. The smallest age group for both groups was under 30 years (2 members per group), followed by more than 50 years (19 participants each group) and 30 to 50 years (29 participants each group). While it is not known whether this accurately represents the age distribution of this research bank employees, the sectioning of the groups was effective.

Marital status. Marital status was somewhat different between groups. The EG included 18 single people, 30 married people, and 2 people that were divorced or widowed. The CG included 13 single people, 32 married people, and five people that were divorced or widowed.

Education. The educational level of the CG and EG was also somewhat different. The EG included 38 people with a Bachelor’s degree and 12 people with higher than a Bachelor’s degree. The CG included 29 people with a Bachelor’s degree and 21 people with higher than a Bachelor’s degree.

Organizational tenure. There were some differences in the organizational tenure. The EG included 13 people who had worked at the bank less than three years, 18 who had worked there three to six years, 15 who had worked there seven to 10 years, and four who had worked there more than 10 years. The CG included 10 people who had worked at the bank less than three years, 10 people who had worked there three to six years, 17 people who had worked there seven to 10 years, and 13 people who had worked there more than 10 years.

Total work experience. The EG included 19 people with three to six years of total work experience, 21 with seven to 10 years of total work experience, and 10 with more than 10 years of total work experience. The CG included 13 people with three to six years of total work experience, 20 with seven to 10 years of total work experience, and 17 with more than 10 years of total work experience.
Work position. The EG was made up mainly of relationship managers (n = 20) and credit analysts (n = 20), along with assistant vice presidents (n = 7), first vice presidents (n = 2), and vice presidents (n = 2). The CG included similar distributions, including relationship managers (n = 21) and credit analysts (n = 22), along with assistant vice presidents (n = 3), first vice presidents (n = 2), and vice presidents (n = 2). This shows that there were employees included from across the organizational structure.

In summary, the gender and age distribution and work position of the EG and CG groups was similar. However, the CG group was slightly more highly educated on average, and had longer organizational tenure and work experience. Although these two groups are not completely equivalent, their demographic equivalence is strong. Furthermore, members of all the groups of concern are included in the survey. Therefore, the analysis can continue as planned.

Job Stress

There were four sources of job stress identified in the literature, including job stress from role conflict, job stress from role ambiguity, job stress from role overload, and job stress from role characteristics. Furthermore, symptoms from job-related stress were also investigated.

Means and standard deviations for the pre-test (before) and post-test (after) period are reported for each of these variables. The means can be understood in context by comparing them to the original rating scale that was used in the questionnaire. This rating scale included the following points of agreement:

- 1: Strongly disagree
- 2: Disagree
- 3: Neutral
- 4: Agree
- 5: Strongly agree

Therefore, mean responses can be compared to these original points to understand the general trend in the responses.

Additionally, t-tests are used to determine whether the before and after means have changed significantly for each group. The t-tests are reported at the end of each of these sections.

Job Stress from Role Conflict

Job stress from role conflict included causes of stress including work-life balance, conflicts between professional ethics and supervisory demands, and conflicting demands from different bosses or working groups. Job stress from role conflict was measured using a series of seven items. Table 6 presents the before and after means and standard deviations for the EG group, while Table 7 presents the same data for the CG group.

In the pre-test period, average mean stress levels for the EG (M = 4.59, SD = .253) and CG (M = 4.44, SD = .536) were similar. The overall pattern of responses was also similar. For example, the most stressful experience was “I feel under pressure to do things against my professional ethics…” (EG: M = 4.84, SD = .370; CG: M = 4.76, SD = .476). Thus, for both groups, being pressured against their professional ethics was the most stressful role conflict-related stressor that they experienced in the pre-intervention period. The response groups also shared a least-stressful role conflict factor in the pre-response period, which was “Because of my work demands I have no time for my family” (EG: M = 3.96, SD = .947; CG: M = 3.68, SD = 1.077). Overall, the stress levels reported from the various factors was similar for each of the individual item, although the exact means varied slightly between the groups. Thus, the pre-test period showed that the EG and CG groups had a similar level of reported stress from role conflict. Furthermore, with means above 4.0, the reported rate of stress is also very high.

In the post-test period, the mean reported job role stress fell for the EG group (M = 3.97, SD = .490) but remained about the same for the CG group (M = 4.53, SD = .429). Overall, however, the relative reported stressfulness of each of the role conflict sources remained the same. “I feel under pressure to do things against
my professional ethics…” remained the most commonly reported stressor in both groups (EG: M = 4.74, SD = .443; CG: M = 4.94, SD = .240). In fact, this item fell only slightly for the EG group, especially compared to the much higher drops for the other factors, and increased for the CG group. Therefore, this remained among the most stressful responses identified. “Because of my work demands I have no time for my family” remained the least stressful item for both groups (EG: M = 3.60, SD = 1.050; CG: M = 3.74, SD = .899). However, this item reflects the fall in means that the EG group experienced, while the CG group did not. Overall, the stress levels for the CG remained high in the post-intervention period, but they fell sharply in the post-intervention period for the EG.

The mean statistics for stress from job role conflict shows that there are some stressors that are present for both groups in the pre-intervention and post-intervention periods, and not all stressors fell during this period. However, the descriptive statistics also show that there was a significant mean reduction for the EG group, but not for the CG group, for many of the items in the job role conflict scale in the post-intervention period. This does not conclusively prove that the Mahajanaka intervention caused this fall, but it does suggest that it did so. This is tested in the hypothesis tests.

Job Stress from Role Ambiguity

Job stress from role ambiguity was measured using seven items. These items addressed sources of stress like uncertainty surrounding job descriptions, work duties, and lines of authorities, missing or incompatible policies and guidelines, and uncertainty about performance expectations. The descriptive statistics for these items are shown in Table 8 for the EG group and Table 9 for the CG group.

In the pre-intervention period, average job stress from role ambiguity was similar for the EG group (M = 4.47, SD = .202) and the CG group (M = 4.39, SD = .247). As with job stress from role conflict, the pattern of relatively more and less stressful job role ambiguity factors was similar between the two groups. The highest stress level was reported for both groups for the item “I feel stress when I do not know if my work will be acceptable to my boss” (EG: M = 4.92, SD = .274; CG: M = 4.78, SD = .465). In contrast, the lowest stress level was reported for the item “I do not know what the goal of my task is” (EG: M = 3.26, SD = .527; CG: M = 3.12, SD = .594). Therefore, in both groups during the pre-intervention period, the most reported stress was uncertainty about job performance and the least reported stress was goal uncertainty. However, absolute stress levels were high for both groups in this period.

In the post-intervention period, reported stress from role ambiguity fell for the EG group (M = 3.92, SD = .348), but climbed slightly for the CG group (M = 4.50, SD = .224). “I feel stress when I do not know if my work will be acceptable to my boss” remained the most stressful experience for CG, but fell sharply in stress levels for EG, making it the least stressful experience (EG: M = 2.88, SD = .746; CG: M = 4.86, SD = .406). The previously least stressful experience for both groups, which was “I do not know what the goal of my task is”, was similarly stressful for the EG group, but became slightly more stressful for the CG group (EG: M = 3.24, SD = .555; CG: M = 3.30, SD = .678). In the post-intervention period, the most stressful role ambiguity factor was tied between “I am not clear of the job description of my position” (M = 4.42, SD = .672) and “I feel high stress when I work under incompatible policies and guidelines…” (M = 4.42, SD = .673). These two factors had been among the higher stress conditions in the pre-intervention period as well.

In summary, during the pre-intervention period, the EG and CG groups had similar stress levels and stress factors. However, in the post-intervention period it is noticeable that the EG group became much less stressed about not knowing their supervisor’s performance expectations. It is possible that this is because the intervention encouraged participants to ask about and clarify expectations for performance, which would remove this source of stress for those that had participated in the intervention. This possibility is discussed in the next chapter, which integrates these findings with the literature review.

Job stress from role overload was measured using a set of seven items. These items addressed sources of stress like lack of time and resources to complete work, excess demands or performance standards, and inability to
effectively prioritize tasks. Means and standard deviations for the EG group are reported in Table 10, while Table 11 reports the results from the CG group.

In the pre-intervention period, the average job stress from role overload was similar for the EG group (M = 4.48, SD = .211) and the CG group (M = 4.40, SD = .233). As with other sources of job related stress discussed above, the issues that were perceived as stressful were also similar. For example, the highest mean stress level was reported for “I feel the performance standards on my job are too high” for both groups, and the means for this item were very similar (EG: M = 4.80, SD = .452; CG: M = 4.82, SD = .333). Similarly, respondents were least likely to feel that “my workload does not give me time to develop myself” (EG: M = 3.14, SD = .452; CG: M = 2.94, SD = .740). Overall stress levels from role overload in the pre-intervention period were reported to be relatively high, as were other sources of stress discussed above and below. Thus, in the pre-intervention period, both groups were stressed from role overload, with especially high pressure coming from high performance standards.

In the post-intervention period, the average job stress from role overload dropped substantially for the EG group (M = 4.05, SD = .340), but rose very slightly for the CG group (M = 4.53, SD = .231). In both groups, respondents remained least concerned that “My workload does not give me time to develop myself” (EG: M = 2.98, SD = .622; CG: M = 3.22, SD = .887). However, while this mean item fell in the EG group, it rose somewhat in the CG group. There was also a change in the highest mean job stressor from role overload. For both groups “I feel the performance standards of my job are too high” was no longer the highest-ranking item, although it was still relatively high in importance for both groups. Instead, the EG group had the highest mean for “I have too much work to do everything well” (M = 4.34, SD = .593), while the CG group had the highest mean for “I feel there is a lack of resources needed to fulfill my commitments, or perceive that a task cannot be completed in the given time” (M = 4.82, SD = .438). Thus, in the post-intervention period, the concerns of the EG and CG groups diverged, as well as the change in means.

In summary, the pre-intervention period was very similar for the EG and CG groups in terms of job stress from role overload. In the post-intervention period, reported stress levels fell substantially for the EG group, but rose slightly in the CG group. Furthermore, what the respondents considered most and least stressful diverged. This implies that the intervention may have influenced perceptions of stress and how individuals manage these stress factors.

**Job Stress from Job Characteristics**

Job stress from job role characteristics, the fourth scale of job stressors, was measured using seven Likert items. These items addressed job stressors like highly complex or process-driven tasks, job complaints, responsibility, high task variety, high levels of job effects, and boredom (not being able to work on interesting projects). Results for the EG group are shown in Table 12, while results for the CG group are shown in Table 13.

In the pre-intervention period, average job stress was similar for the EG group (M = 4.62, SD = .230) and the CG group (M = 4.53, SD = .297). Job stress from job characteristics was also very high on average, as this was the highest mean reported during the pre-intervention period for both groups. Unlike other items, there was a slight difference in the relative means for these items in the pre-intervention period. For the EG group, the highest reported stress was “I feel strong stress when there are many people who can complain about my job performance” (M = 4.90, SD = .364). In comparison, the highest reported stress for the CG group was “I feel high pressure when my work requires a lot of responsibility” (M = 4.80, SD = .495). This difference may be due to the slight difference in job roles between the two groups, as the CG group had slightly more high-ranking and long-serving employees than the EG group did. For both groups, there was the lowest stress level reported for “I feel high stress when there is a lot of variety on my job…” (EG: M = 3.94, SD = 1.242; CG: M = 3.36, SD = 1.064). Thus, in the pre-intervention period, both EG and CG groups reported very high job stress from job role characteristics, although the specific factors that were stressful varied.

In the post-intervention period, job stress from job role characteristics fell for the EG group, although it remained the most stressful category of job stressors (M = 4.11, SD = .270). However, stress from job role characteristics
remained essentially the same in the CG group (M = 4.53, SD = .334). Thus, while for the EG group job role characteristics were only moderately stressful, they remained highly stressful for the CG group. The importance of specific stressors also changed. For the EG group, “I feel strong stress when there are many people who can complain about my job performance” fell from the most stressful item in the pre-intervention period to the least stressful item in the post-intervention period (M = 2.96, SD = .968). The most stressful items for the EG group in the post-intervention period became “I feel strong stress when my task has a high degree of process” (M = 4.52, SD = .614) and “While performing my job I do not get the opportunity to work on many interesting projects” (M = 4.52, SD = .580). The CG group also reported that “I feel strong stress when my task has a high degree of process” was the most stressful job role characteristic (M = 4.72, SD = .607).

In summary, both the EG and CG groups had shifting perceptions of the stress levels of specific factors. The CG group had the same stress level about job role characteristics in the post-intervention period, but the EG group had a substantial drop in stress levels. For both groups, job role characteristics remained stressful.

Work-Related Stress Symptoms

The final scale included work-related stress symptoms. This scale of nine items measured physical symptoms like trouble sleeping, loss of appetite, stomach aches, headaches and dizziness, as well as psychological symptoms like tiredness and detachment from work. The EG group responses are shown in Table 14, while the CG group responses are shown in Table 15.

In the pre-intervention period, both groups showed a high and similar level of work-related stress symptoms (EG: M = 4.63, SD = .290; CG: M = 4.55, SD = .413). In both groups, the most frequently reported symptom of stress was stomach ache (EG: M = 4.86, SD = .351; CG: M = 4.80, SD = .542). The least reported symptom for the EG group was Friday/Monday blues (M = 4.48, SD = .647), while trouble sleeping was the last reported symptom for the CG group (M = 4.34, SD = .848). Almost every other item reported in both groups was at M = 4.50 or above. This indicates that there was a wide experience of physical symptoms of stress in both of the groups.

In the post-intervention period, experience of stress-related symptoms fell in the EG group, although it could still be considered relatively high (M = 4.12, SD = .372). In the CG group, mean reported stress-related symptoms was actually higher than it had been in the pre-intervention period (M = 4.65, SD = .332). The most frequently reported item for the CG group remained stomach aches (M = 4.82, SD = .438), which occurred in the group at the same frequency as they had in the pre-intervention period. Similarly, the least reported symptoms, including trouble sleeping (M = 4.50, SD = .735) and Friday/Monday blues (M = 4.50, SD = .580) were similar in the post-intervention period for the CG group. Overall, it appeared that the CG group did not have much change in their stress symptoms in the intervening period. However, in the EG group, there were some significant changes. The most reported symptom was now headaches (M = 4.22, SD = .545), although these were reported less frequently in the post-intervention period than in the pre-intervention period. In contrast, the least-reported symptom was now trouble sleeping (M = 3.96, SD = .570), which had been the second least reported symptom.

In summary, the post-intervention period saw a reduction in stress-related symptoms for the EG group, but not for the CG group. The specific order of symptoms did change slightly, although the mean scores for individual symptoms was close together in both groups and in both periods. Perhaps most importantly, the rate of stress-related symptoms reported in the EG group was still moderately high, even though it had reduced. This suggests that the intervention reduced but did not eliminate stress-related symptoms for the intervention group, which is discussed in Chapter 5.

Comparison of Group Means Before and After Intervention

T-tests were used to investigate the difference between the group means between the pre-intervention and post-intervention surveys (Table 16). This analysis showed that in all four job stress sources and in symptoms from all job-related stressors, there were significant mean differences for the EG group. Referring to the descriptive statistics discussed above, these were all reductions in the mean scale scores, indicating that overall perception of
job stress had fallen. In the CG group, there was no significant difference in several dimensions, including job stress from role conflict, job stress from job role characteristics, and symptoms from all job-related stressors. There were two significant mean differences in job stress from role ambiguity and role overload. The descriptive statistics above showed that these scale averages climbed slightly in the post-intervention period compared to the pre-intervention period. Therefore, it can be stated that the EG group (which received the intervention) had a reduction in mean job stress and symptoms, but the CG group (which did not receive the intervention) had job stress and symptoms that were the same or slightly higher. In the next section of this chapter, the hypothesis tests are used to evaluate whether there were significant differences between these groups.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>EG Group</th>
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<th>CG Group</th>
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<td>.006</td>
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<tr>
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<td>1.334</td>
<td>98</td>
<td>.185</td>
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Table 2 Mean comparisons pre- and post- intervention for each group

Hypothesis Results

There were three hypotheses that were tested in this study. This included stress in different demographic and occupational groups (Hypothesis 1) (Section 4.3.1), pre-intervention work stress (Hypothesis 2) (Section 4.3.2), and post-intervention work stress (Hypothesis 3) (Section 4.3.3). The results of the hypothesis tests are discussed in detail below, and summarized in Section 4.3.4.

Stress in Different Demographic and Occupational Groups (Hypothesis 1)

Hypothesis 1 was concerned with differences in job stress levels between different demographic groups. These differences were tested based on the pre-testing questionnaires, using a combination of one-way ANOVA and independent t-test for difference in means depending on the number of groups. All values are tested at p < .05.

Stress in different age groups (H1_1)
The first part of Hypothesis 1 investigated stress in different age groups, stating that:

H1_1: There is a significant difference in job stress levels among age groups.

This hypothesis was tested using one-way ANOVA. Table 17 shows the descriptive statistics for the different groups. This shows that the mean stress from role conflict is similar to the group mean for all three groups, but stress from role ambiguity is far higher for those under age 30 than it is for other groups or for the group mean. Stress from role overload is also highest among the youngest respondents, but stress from job characteristics is similar across the age groups. Symptoms from all work-related stressors is highest in the youngest age group and lowest in the highest age group.

The ANOVA test (Table 18) shows that there are no significant differences between groups for stress from role conflict (F = .031, p = .969), stress from role overload (F = 2.264, p = .109), or stress from job characteristics (F = .237, p = .790). However, there are significant differences in stress from role ambiguity (F = 4.130, p = .019) and symptoms from all work-related stressors F = 4.409, p = .015).

LSD post hoc comparison was used to identify significant mean differences (p < .05) (Table 19). As anticipated from the mean differences, stress from role ambiguity was significantly higher by .294 points in the under 30 years age group than it was in the 30 to 50 years age group, though there was no significant difference in the 50+ years group. There was also significantly higher mean differences observed between the less than 30 and more than 50 years age group for stress from role overload, with stress from role overload .241 points higher for the younger group than the older group. Finally, for symptoms from all work-related stressors, the less than 30 years
The youngest age group is significantly more likely to suffer from stress from role ambiguity and role overload than older respondents, and the oldest age group is least likely to suffer symptoms of stress. Therefore, H11 can be accepted, even though not all sources of stress were different between age groups.

**Stress in different age groups (H11)**

Hypothesis 21 was concerned with stress between gender groups, stating that:

H11: There is a significant difference in job stress levels between male and female employees.

This hypothesis was tested using an independent samples t-test. Descriptive statistics (Table 20) show that there are minor mean differences in all categories, although these did not typically reach higher than .13 points difference between groups. Thus, it is not clear from the descriptive statistics whether there are significant differences.

The independent samples t-test results are shown in Table 21. The Levene’s test for equality of variance was used to determine whether equal variances could be assumed (p > .05).

For stress from role conflict (F = 1.632, p = .204) equal variances could be assumed. The t-test results (t = 1.581, p = .117) did not indicate a significant mean difference in stress from role conflict between male and female respondents.

For stress from role ambiguity (F = .790, p = .376), equal variances could be assumed. Once again, the t-test results (t = .869, p = .387) did not indicate a significant mean difference between gender groups for this scale.

For stress from role overload (F = 4.323, p = .040), equal variances could not be assumed. The t-test results (t = -1.953, p = .054) indicated that although the results approached significance, the difference between male and female responses was still not significant.

For stress from job characteristics (F = 1.044, p = .309) equal variances could be assumed. The t-test results (t = -1.666, p = .099) did not support a significant gender difference in this category.

Finally, for symptoms of all work-related stressors (F = .290, p = .591) equal variances could be assumed. However, the t-test (t = -.427, p = .670) did not indicate a significant mean difference between male and female responses.

In summary, there was no indication that there were significant mean differences between male and female respondents either in experience of stress from different sources or in symptoms of work-related stressors. Therefore, H21 is rejected.

**Stress in different work positions (H13)**

Hypothesis 13 investigated stress in different work positions, stating that:

H13: There is a significant difference in job stress levels among work positions.

This hypothesis was tested using one-way ANOVA. Descriptive statistics are shown in Table 22. The descriptive statistics show similar means for all positions in stress from role conflict and stress from job characteristics, with more variation in stress from role ambiguity and role overload. There was also some variation in symptoms from all work-related stressors.

The ANOVA tests are shown in Table 23. This shows that mean differences are not significant for stress from role conflict (F = .102, p = .981), stress from role ambiguity (F = .468, p = .759), stress from role overload (F = 1.957, p = .107), stress from job characteristics (F = .350, p = .843), or symptoms from all work-related stress (F
= .485, p = .747). Similarly, the LSD multiple comparisons (Table 24) showed only a few scattered significant differences.

The ANOVA results allow for the rejection of H1 since there is no evidence that stress from work sources or symptoms from work-related stress are significantly different between groups based on their job roles. Instead, stress and symptoms of stress are similarly high between all occupational roles in the organization.

**Stress in different tenure groups (H1)**

Hypothesis H1 was concerned with stress between different tenure groups. This hypothesis stated that: H1: There is a significant difference in job stress levels between different years of work experience.

This hypothesis was tested using one-way ANOVA. The descriptive statistics (Table 25) do show some mean differences between groups for stress from role conflict, stress from role overload, and stress from job characteristics, along with symptoms from all work-related stressors, although means for different groups are similar for stress from role ambiguity.

However, the ANOVA results (Table 26) show that there were no significant mean differences in stress from role conflict (F = 2.182, p = .095), stress from role ambiguity (F = .170, p = .916), stress from role overload (F = 1.217, p = .308), stress from job characteristics (F = 2.179, p = .096) or symptoms from all work-related stressors (F = 1.318, p = .273). Similarly, the multiple comparisons do not identify any significant between groups differences (Table 27).

Given these results, Hypothesis H1 is rejected. There is no difference in stress levels from different sources or in stress-related symptoms based on tenure at the company.

**Work Stress Prior to Introduction of Mahajanaka (Hypothesis 2)**

Hypothesis 2 was concerned with work stress levels in the EG and CG groups prior to the *Mahajanaka* intervention. It stated that:

H2: There are no significant differences in job stress levels between control group and experimental group before introducing Mahajanaka story.

A series of five independent t-tests for difference in means was conducted between the two groups. Each of these is examined at a significance level of p < .05. These t-tests showed that there were no significant mean differences in the pre-intervention period between the CG and EG groups in any of the work-related stress sources or in work-related stress symptoms. Therefore, H2 was fully accepted.

**Pre-intervention stress levels from role conflict (H2)**

The first t-test addressed pre-intervention stress levels resulting from role conflict, which tested the hypothesis: H2: There is no significant difference in job stress levels from role conflict between control group and experimental group before introducing Mahajanaka story.

The descriptive statistics (Table 28) do show a slight mean difference, with the mean of the EG group (M = 4.59) being slightly higher than the mean of the CG group (M = 4.44). T-test results (Table 29) are used to determine whether this is significant. The Levene’s test (F = 2.350, p = .128) indicate equal variance between the groups. However, the t-test (t = 1.773, p = .079) does not indicate a significant difference between the means. Therefore, H2 is accepted.

**Pre-intervention stress levels from role ambiguity (H2)**

Pre-intervention stress levels from role ambiguity was tested using the following hypothesis:

H2: There is no significant difference in job stress levels from role ambiguity between control group and experimental group before introducing Mahajanaka story.

The mean descriptive statistics (Table 30) once again show a slight mean difference, with the mean job stress from role ambiguity slightly higher for the EG group (M = 4.47) than for the CG group (M= 4.38). The Levene’s
test indicated equal variances (F = 1.594, p = .210) (Table 31). The t-test did not show a significant difference in means between groups (t = 1.898, p = .061). Therefore, H2 was also accepted.

**Pre-intervention stress levels from role overload (H2)**

Pre-intervention stress levels from role overload were evaluated using the following hypothesis:

**H2:** There is no significant difference in job stress levels from role overload between control group and experimental group before introducing Mahajanaka story.

The descriptive statistics (Table 32) show that there was a slight mean difference, with the EG group (M = 4.48) once again having a slightly higher mean than the CG group (M = 4.40). The t-test (Table 33) followed. The Levene’s test (F = .340, p = .561) indicated that equal variances could be assumed. The t-test did not indicate that this was a significant mean difference (t = 1.735, p = .086). Therefore, H3 could also be accepted.

**Pre-intervention stress levels from role characteristics (H2)**

Pre-intervention stress levels from role characteristics were assessed using the following hypothesis:

**H2:** There is no significant difference in job stress levels from role characteristics between control group and experimental group before introducing Mahajanaka story.

As with the other stress factors, the descriptive statistics (Table 34) indicate a small difference, with the EG group (M = 4.62) having slightly higher mean stress from role characteristics than the CG group (M = 4.53). The t-test followed (Table 35). The Levene’s test indicated equal variances (F = 2.570, p = .112). The t-test outcome (t = 1.560, p = .122) did not indicate a significant mean difference. Therefore, H2 could also be accepted.

**Post-intervention work-related stress symptoms (H3)**

The final sub-hypothesis of H2 investigated the difference in symptoms from work-related stress, investigating the following relationship:

**H3:** There is no significant difference in symptoms from all work-related stressors between control group and experimental group before introducing Mahajanaka story.

The descriptive statistics (Table 36) once again show a slightly higher mean stress symptom rating for EG group members (M = 4.63) than for CG group members (M = 4.55). Once again, the Levene’s test (F = .270, p = .605) indicated equal variances (Table 37). The t-test results (t = 1.091, p = .278) did not indicate a significant mean difference between these two groups. Therefore, H3 could also be accepted. In summary, there was no indication of significant mean differences between the EG and CG groups on workplace stress experiences or symptoms prior to the intervention.

**Work Stress Following Introduction of Mahajanaka (Hypothesis 3)**

Hypothesis 3 was concerned with the effect of the *Mahajanaka* intervention on the EG group. It stated that:

**H3:** There are significant differences in the levels of job stress between group of Mahajanaka users (the EG group) and Mahajanaka non-users (the CG group).

Like Hypothesis 2, Hypothesis 3 was tested using a series of independent t-tests for difference in means, which are presented individually below. Each t-test was evaluated at p < .05 for acceptance. The results showed that the EG group had significantly lower stress levels from all sources and symptoms from all work-related stress than the CG group following the intervention. Therefore, H3 was fully accepted.

**Post-intervention stress levels from role conflict (H3)**

Differences in post-intervention stress from role conflict between groups was tested using the following hypothesis:
H3₁: There is a significant difference in the levels of job stress from role conflict between group of Mahajanaka users and Mahajanaka non-users.

The descriptive statistics (Table 38) show that there is a large difference in means, with the EG group (M = 3.97) having a much lower mean stress from role conflict than the CG group (M = 4.53). The Levene’s test (F = .237, p = .627) indicated equal variances in the groups for the t-test (Table 39). The t-test results (t = -6.023, p < .001) indicate a significant mean difference, with an average of .55 points between the EG and CG groups. Therefore, H3₁ can be accepted, since the EG group (which did receive the Mahajanaka text) had a significantly lower mean stress from role conflict than the CG group (which did not).

**Post-intervention stress levels from role ambiguity (H3₂)**

The descriptive statistics (Table 40) once again show a significantly lower mean for the EG group (M = 3.92) than for the CG group (M = 4.50) for stress from role ambiguity. The Levene’s test (F = 7.790, p = .006) indicates that there is unequal variance in this case (Table 41). The t-test (t = -9.915, p < .001) shows that there is a significant difference between these two groups, with the EG having a mean difference of .58 points compared to the CG group. Therefore, H3₂ can also be accepted, since the EG group (which received the Mahajanaka intervention) did have a significantly lower mean stress from role ambiguity than the CG group (which did not).

**Post-intervention stress levels from role overload (H3₃)**

Differences between the EG and CG groups in post-intervention stress from role overload were tested using the following hypothesis:

H3₃: There is a significant difference in the levels of job stress from role overload between group of Mahajanaka users and Mahajanaka non-users.

The descriptive statistics (Table 42) showed that the EG group (M = 4.05) had a much lower mean stress level from role overload than the CG group (M = 4.53). The Levene’s test (F = 2.781, p = .099) indicate that there were equal variances between the group (Table 43). The t-test (t = -8.260, p < .001) confirms that the mean difference of .48 points between the EG and CG groups was statistically significant. Therefore, H3₃ was accepted, since the EG group (which received the Mahajanaka intervention) had significantly lower stress from role overload than the CG group (which did not).

**Post-intervention stress levels from job characteristics (H3₄)**

Between-groups differences in post-intervention stress from job characteristics was tested using the following hypothesis:

H3₄: There is a significant difference in the levels of job stress from role characteristic between group of Mahajanaka users and Mahajanaka non-users.

The descriptive statistics (Table 44) showed that the EG group (M = 4.11) did have a lower mean stress from job role characteristics than the CG group (M = 4.53). The Levene’s test (F = 2.642, p = .107) did indicate equal variances (Table 45). The t-test results (t = -6.909, p < .001) also indicated a significant mean difference, with the EG group having a mean .42 points lower score than the CG group here. Therefore, H3₄ can also be accepted, since the EG group (which did receive the Mahajanaka intervention) did show lower stress levels from job role characteristics than the CG group (which did not receive it).

**Post-intervention work-related stress symptoms (H3₅)**

The final sub-hypothesis of H3 investigated differences in symptoms from work-related stressors between groups. It was stated as follows:

H3₅: There is a significant difference in the symptoms from all work-related stressors between group of Mahajanaka users and Mahajanaka non-users.
This hypothesis, as the others in this group, was tested using independent t-tests. The descriptive statistics (Table 46) show that the EG group (M = 4.12) had a lower mean for work-related stress symptoms than the CG group (M = 4.65). The Levene’s test (F = 4.372, p = .039) indicated that equal variances could not be assumed (Table 47). The t-test outcome confirmed that there was a significant mean difference between the two groups (t = -7.625, p < .001). The results also showed that there was a .54 point difference between the two groups. Therefore, H3 can be accepted, since the EG group (which received the Mahajanaka intervention) had a significantly lower mean than the CG group (which did not).

This final sub-hypothesis test allows for the conclusion that the Mahajanaka intervention lowered the mean stress level and symptom level significantly for the experimental group as compared to the control group.

### Summary of Hypothesis Outcomes

Table 48 summarizes the hypothesis testing outcomes. These outcomes are examined in detail in the next chapter.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Statement</th>
<th>Accepted?</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1_1</td>
<td>There is a significant difference in job stress levels among age groups.</td>
<td>Yes</td>
</tr>
<tr>
<td>H1_2</td>
<td>There is a significant difference in job stress levels between male and female employees.</td>
<td>No</td>
</tr>
<tr>
<td>H1_3</td>
<td>There is a significant difference in job stress levels among work positions.</td>
<td>No</td>
</tr>
<tr>
<td>H1_4</td>
<td>There is a significant difference in job stress levels between different years of work experience.</td>
<td>No</td>
</tr>
<tr>
<td>H2</td>
<td>There are no significant differences in job stress levels between the control group and experimental group before introducing Mahajanaka story.</td>
<td>Yes</td>
</tr>
<tr>
<td>H3</td>
<td>There is a significant difference in the levels of job stress between groups of Mahajanaka users (experimental group) and Mahajanaka non-users (control group).</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 3 Summary of hypothesis testing outcomes

### Chapter Summary

This chapter has presented the descriptive statistics and hypothesis tests that were used to evaluate the pre-test/post-test surveys that surrounded the Mahajanaka intervention. The results showed that in the pre-test period, stress levels and symptoms of stress were generally very high within both the control and experimental groups, and that these levels were similar between the two groups. The results also showed that although there were some minor differences in stress from some sources between respondents of different age groups, they were consistent across other demographic and workplace groups. Therefore, prior to the intervention, it can be stated that all of the respondents experienced a high level of workplace stress and symptoms related to work stress, regardless of whether they were assigned to the control or experimental groups. The findings also showed that the experimental group that received the Mahajanaka intervention reported significantly lower stress levels from all four workplace stressors, as well as significantly lower symptoms from work-related stress, compared to the control group, which did receive the intervention. These findings demonstrate that the use of the Mahajanaka as a stress reduction tool in the workplace was effective at lowering stress experiences and symptoms for the experimental group. In the next chapter, the implications of these findings are discussed using the literature review which was outlined in Chapter 2. The next chapter also presents a conclusion and reflection on the limitations of the study and its implications for practice and academic research.

### Discussion, Conclusion and Recommendations

In the previous chapter, the analysis of data collected prior to and following the Mahajanaka intervention was presented. This analysis showed that while the two groups were similar prior to the study, the group that read the Story of Mahajanaka reported significantly lower stress levels and mental and physical well-being symptoms compared to the control group. The goal of this chapter is to contextualize and interpret these findings and draw conclusions from the findings. The chapter begins with a comprehensive discussion of the findings, including the
The key findings of the study can be summarized as follows. First, employees at this research bank reported high levels of stress from all factors and high levels of both mental and physical symptoms. The group that went through the intervention using the Story of Mahajanaka as the guiding philosophy reported reduced (though still absolutely high) levels of stress and reduced symptom levels compared to the control group, who remained essentially unchanged throughout the course of the 10-week intervention period. Therefore, it can be stated that the intervention was successful at reducing perceived stress and symptoms in the intervention group, who received benefits that were not available to the control group. The findings also support the use of the Story of Mahajanaka as a culturally relevant philosophical text for Thai organizations and employees.

The goal of this section is to discuss the findings in comparison to the literature review, evaluating expected and novel findings, new contributions, and other issues that have emerged from this synthesis. There are eight key areas of discussion. These include the outcomes of the intervention and consistency with the existing literature; the effectiveness of the workplace stressor and symptom model used in this research; the importance of intervention design and implementation in the outcomes; the consistency of the findings with previous literature on workplace stress in specific contexts such as the banking sector, Thailand, and cross-cultural contexts; and consistency of findings on individual characteristics such as demographics and job roles. These eight areas each reflect on a different aspect of the study findings and their relevance in the literature.

Evidence of Stress in this research Bank and Outcomes of the Intervention

The present study found that the employees in both groups in the study had high levels of stress from workplace stressors including role conflict, role ambiguity, role overload, and role characteristics. This was consistent with previously reviewed studies, which showed that all four of these factors could be sources of stress (Ahsan, et al., 2009; Aoki & Keiwkarnka, 2011; Azad, 2014; Bacharach, et al., 1990; Beh & Loo, 2012; Bischoff, et al., 1999; Kaewanuchit & Sawangdee, 2016; Kaewboonchoo, et al., 2014; Kaur & Sharma, 2016; Khamisa, et al., 2015; Knudsen, et al., 2007; Lambert & Paoline, 2008; Mark & Smith, 2011; Oke & Dawson, 2008; O'Neill & Davis, 2011; Ram, et al., 2011; Shultz, et al., 2010; Snow, et al., 2003; Soltani, et al., 2013; Yiengprugsawan, et al., 2014; Yongkang, et al., 2014; Yuwanich, et al., 2016; Zhao & Ghiselli, 2016). In keeping with the majority of these studies, the current findings did not support that workers experienced stress from only one of the factors, but instead found that all four workplace stress categories had a high effect on the individual. Thus, in terms of the sources of stress, this study was consistent with the expected findings from previous research, which identified many of the same stressors in other organizational contexts.

One of the areas where this study was somewhat different from previous studies was that it focused mainly on personal well-being of organization members, including physical and mental well-being. Many previous studies have had this focus, in keeping with the known effects of stress on the personal well-being of those that experience it, which is a significant part of the practical literature on stress in the workplace (Bickford, 2005; Bischoff, et al., 1999; Carr, et al. 2011; Knudsen, et al., 2007; Mark & Smith, 2011; Michie, 2002; Örtqvist & Wincent, 2006; Rössler, 2012; Shultz, et al., 2010; Snow, et al., 2003; Somentag & Frese, 2003; Spielberger & Reheiser, 2005; Yiengprugsawan, et al., 2013; Yuwanich, et al., 2016). However, this focus on the individual is not universal. Rather than the effect on the individual’s well-being, many previous studies have chosen to focus on organizational outcomes like organizational commitment, intent to turnover, job satisfaction or job performance (Ahsan, et al., 2009; Kaewboonchoo, et al., 2014; Shukla & Sinha, 2013; Khamisa, et al., 2015; Lambert & Paoline, 2008; Ram, et al., 2011). Furthermore, it was unusual for a full inventory of mental and physical effects to be investigated, with only one study including multiple such effects (Shultz, et al., 2010). Although organizational outcomes are certainly relevant, the reason for focusing on individual well-being...
outcomes in this research is because the study was being implemented as part of the organization’s primary health and well-being intervention schedule. Thus, it was more appropriate for this research to evaluate personal outcomes including mental and physical health, rather than the organizational outcomes that are so often the concern of such studies.

Finally, this research showed that the Story of Mahajanaka was a successful choice for the study intervention. The Story of Mahajanaka has been recognized as a philosophical allegory or folktale representing the King’s seminal philosophy of the sufficiency economy (Kosaiyakanont, 2014; Potchanakaew, 2018). The underlying tale has special significance for Thailand, where it is one of the most important of the Mahanipata Jākata (Appleton, 2010). It has also come to play an important role in the formation of sustainability and environmental ethics (Vivian & Chatelier, 2015). As a result, it was anticipated that this would be an effective philosophical tool for the study, which is why it was selected. However, because it had not been tried previously, this was not certain. Thus, the demonstration that the Story of Mahajanaka is an effective stress management tool is a significant contribution to the literature, both specifically in relation to this tool and as a more general indication of what kinds of tools may be useful for stress management intervention. This point is addressed in more detail below.

**Efficacy of the Stress and Symptom Model**

This research used a stress and symptom model which classed workplace stressors in four scales (role conflict, role ambiguity, role overload, and role characteristics), along with a general symptom scale that included both mental and physical well-being effects. This approach was chosen based on a general model available within the literature, which identified these factors (Bickford, 2005; Carr, et al., 2011; Colligan & Higgins, 2005; Jackson & Schuler, 1985; Michie, 2002; Schmidt, et al., 2014; Sonnentag & Frese, 2003). However, it was not based on a single existing instrument. This approach was chosen because while there are multiple measures and models of workplace stress and workplace stress effects (Phakthongsuk & Apakupakul, 2008; Sembajwe, et al., 2012; Smith, 2000), most of the measures that could be found did not address the specifics of the banking sector or a wide range of stressors. There are also other problems with these measures, including lack of cultural relevance (since only one study addressed stress in Thailand) (Phakthongsuk & Apakupakul, 2008) and a lack of focus on specific stressors. This problem has been observed in other reviews, which have found that there are few widely applicable instruments for workplace stress and no instruments that have been widely adopted (Tabanelli, et al., 2008). The main purpose of this study was not development of a theoretical model and instrument, but the effectiveness of the stress and symptom model developed from existing practice models in this study does provide a potential basis for theoretical expansion. While additional work would be required, the instrument used in this study could serve as the basis for a general workplace stress instrument. This could serve as the basis for future investigation of stress interventions for Thai organizations and as a general model of workplace stress and outcomes.

**Importance of Intervention Design and Implementation**

One of the key insights from the literature is that intervention design and implementation has a significant effect on the outcomes of the intervention (Biron, Gatrell, & Cooper, 2010; Sidle, 2008). A surprisingly small number of studies have addressed what causes success or failure of a stress management intervention, with only Biron, et al. (2008) being identified as providing this information. This makes it important to reflect on the factors that created success or failure of an intervention. In the researcher’s opinion, the three key success factors for this study included management support, primary intervention design, and choice of intervention strategy.

This intervention was undertaken, essentially, because of a high level of concern by senior managers of this research bank about the stress levels observed in the organization. As a result, the intervention received substantial resources from the organization to ensure that it was successful, and it was considered for future implementation. This support created conditions for success. As both Biron, et al. (2008) and Sidle (2008) pointed out, top management and stakeholder support is essential for effective implementation.
The choice of a primary intervention strategy was also a critical factor. Primary interventions, which are proactive and aimed at teaching coping and stress management strategies to all employees, are paradoxically both acknowledged to be most successful and implemented least frequently in organizations (Godfrey, et al., 1990; Martin, et al., 2009; Tetrick & Winslow, 2015). In this research, a primary intervention was clearly justified because of high overall stress levels and negative effects within the organization. These findings also support the role of primary interventions in other organizations, to reduce the effect of stress on workers proactively.

Finally, the choice of the Story of Mahajanaka was a factor in the success of the program. Because guidance on philosophical and spiritual texts for stress interventions is so poor, the choice of the Story of Mahajanaka was not supported by strong academic evidence. However, the study results showed that it was in fact highly successful at reducing perceived stress and stress effects in the employees that received the intervention. This finding supports the practical implementation of other interventions at this research bank and elsewhere using the Story of Mahajanaka as a philosophical or meditational tool to teach resilience and coping.

**Contribution of Findings to Understanding Stress and Intervention in Thai Organizations**

Although the literature on stress and interventions in Thai organizations is somewhat limited, there were several studies found that addressed workplace stress in Thai firms (Aoki & Keiwkarnka, 2011; Intarakamhang, 2009; Kaewanuchit & Sawangdee, 2016; Kaewboonchoo, et al., 2014; Yiengprugsawan, et al., 2013; Yuwanich, et al., 2016). The findings were consistent with what was expected given these studies. For example, the findings were consistent with Aoki and Keiwkarnka's (2011) findings that role conflict and role overload had a significant effect on employees in the organization, and that job characteristics had a significant effect as found in other studies (Kaewanuchit & Sawangdee, 2016; Yiengprugsawan, et al., 2013). This research also confirms the mental and physical effects found in previous studies. Where this study truly contributes to the literature is on development of appropriate interventions for Thai organizations. A few other studies have taken up this topic (Bennett, et al., 2016; Charoensukmongkol, 2013; Charoensukmongkol, 2014). However, Bennett, et al. (2016), who studied traditional Thai massage as a stress intervention, did not observe a stress reduction from this factor. This may be because their study used a tertiary intervention, providing an ameliorative measure for individuals that were already highly stressed. Tertiary interventions are known to be relatively unsuccessful compared to primary interventions as used here (Tetrick & Winslow, 2015). Charoensukmongkol (2013, 2014) did identify a successful tool for organizational intervention in her study of mindfulness meditation. This research has built on this finding by identifying a specific philosophical text that can be used for this purpose in organizations. It has also demonstrated that use of intervention tools in Thai organizations can be highly successful. Thus, this study provides value for practical applications of organizational tools for stress interventions in Thailand.

**Conclusion**

This research investigated the potential of the Story of Mahajanaka as a tool for organizational intervention for stress management in a Thai organization, this research bank. The bank’s employees have reported a high level of stress, which has resulted in a similarly high rate of physical and mental symptoms of impaired well-being. The objectives of the study were as follows:

1. To measure the level of work stress from intrinsic job itself and role stressor before and after reading and use the Story of Mahajanaka in bank employees in Bangkok;
2. To study and investigate the working ideas behind the Story of Mahajanaka and apply them as a work stress coping mechanism;
3. To investigate the difference in the level of job stress between demographic groups before reading the Story of Mahajanaka; and
4. To investigate the difference in the level of job stress between work experience groups before reading the Story of Mahajanaka.

All four objectives were accomplished through the intervention strategy, which took place over a period of 10 weeks. Prior to the intervention, a total of 100 employees were randomly selected from all levels of this research bank. These participants were randomly divided into two groups, which were relatively similar in demographic and work characteristics. The intervention began with a pre-test survey of workplace stress and physical and mental symptoms. Workplace stress was measured in four categories, including role conflict, role ambiguity,
role overload, and role characteristics. Both the experimental and control groups reported significant, high levels of workplace stress and symptoms. These measures were all similar between groups during the pre-test, ensuring that the experimental and control groups started at the same baseline (H2). To achieve Objective 3, the pre-test surveys were also analyzed based on demographic and work characteristics, including gender, age, position, and work experience (seniority) (H1). There was a small difference between age groups, with younger participants reporting some higher stress levels than older participants, but other characteristics had no significant differences. Thus, in the pre-test period, the respondents were all broadly similar to each other in terms of workplace stress and symptoms.

The intervention (objective 2) was a primary intervention, intended to teach resilience and coping strategies to the participants as a proactive measure, regardless of the level of stress encountered by the participants. The intervention, which was offered to the experimental group (n = 50) began with a workshop that included the animated film version of the Story of Mahajanaka and a discussion on how the story could be used to reduce stress and improve coping skills. Participants were then given a copy of the Story of Mahajanaka and asked to work on their own over the next ten weeks to read and reflect on the story and its implications.

In the final week of the intervention, all participants in both groups conducted a post-test survey (completing Objective 1). The results showed that those in the control group were still experiencing very high levels of workplace stress and physical and mental symptoms of stress. Those in the intervention group, in contrast, still had experience of workplace stress, but this was significantly lowered compared to the pre-test period. Furthermore (Objective 4), a means comparison showed that in the post-intervention period, the intervention group reported a significantly lower level of all workplace stressors and symptoms.

In conclusion, this research has shown that the Story of Mahajanaka is a philosophical tool that provides a positive benefit for employee coping strategies and stress perceptions in an organizational intervention. The findings are highly relevant for this research bank, but also have implications for practical application and for academic research, which are discussed below.

Research Limitations

Because this research was predominantly intended for practical application in a specific organizational context (this research bank), there are some significant limitations to how far the findings may be applied. The intervention was designed for the specific organizational context and cultural context of this research bank and was directed in part by organizational stakeholders and resources.

5.4 Recommendations for Future Research

Try in the difference environment such as other Thai organization, other foreign companies in Thailand.

References


Redirecting Raphael

The School of Athens Contemporized

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Abstract

In 2017 architecture students reenacted Raphael's *School of Athens*, a crown jewel in the canon of Western art history. The fresco that covers one of the walls in the Stanza della Segnatura at the Vatican features the European elite of philosophers, scientist and Raphael's illustrious Renaissance peers in a pageant of historical greats. The reenactment, however, is more than the kind of tableau sometimes enacted for entertainment at a fine arts graduation party. It is a statement that challenges the canon, argues stereotypes and redirects the debate. It is an art work in its own right. The students' work debunks Renaissance notions in post-modern fashion. High and low culture hierarchy is shattered. Commercial exploitation of an original product is avoided. The cult of originality is replaced by teamwork. The almost all-male cast in the fresco is rebalanced. High-brow pretensions of the fine art of painting are replaced by clever crafts, historically associated with women's work. Contemporary digital media of art-making are given their due, colonialist assumption of western/white superiority is confidently rebuked; local cultural norms are respected. Claims of exclusivity are challenged. This contemporary work of art does not rebel against tradition or denigrate Raphael or Renaissance values. Instead, it seeks to celebrate another rebirth, a Renaissance that embodies the spirit of our age.

**Keywords:** Renaissance, Canon, Appropriation, Post-Modern Reinterpretation, Western Art History in the UAE, Digital Art

REDIRECTING RAPHAEL

On a weekend morning in April 2018 Dean Varkki Pallathucheril had asked me through clever subterfuge to join him for breakfast followed by a site visit to the Main Building of the American University of Sharjah to discuss a problem related to signage. When we had climbed the steps to the plaza I saw a lively and colourful group of about seventy people gathering in front of the west façade. As classes were not in session I assumed this might be a situation where an outside group had rented the splendid auditorium for a graduation ceremony. But very quickly did clues fall into place. These were our own students and faculty and they were dressed up and arranged to make up a very familiar composition: Raphael's fresco painting *The School of Athens*, one of the key works of the Italian Renaissance and a ”required slide” which all first year students at the College of Architecture, Art and Design (CAAD) would have to be able to identify if they hoped to pass the art history courses needed to enter into 2nd year in their chosen major.
I was genuinely delighted by the surprising spectacle and was quickly whisked aside to be dressed as Plato and directed to take my place next to the Dean who posed as Aristotle, both of us equipped with tomes of philosophical treatises.

Re-enacting famous artworks has a bit of a history in art and design schools. Sometimes such projects are assigned in photography courses where students would be challenged to recreate a certain lighting situation that appeared in innovative films. Staging a famous painting or a sculpture group was sometimes part of a light-hearted graduation party. In the Sharjah case, a core group of architecture students started to clone suitable Renaissance topics early in their student days. Raphael's *School of Athens* was their most ambitious project yet and had been selected to mark my retirement after serving the university as founding dean and art history professor since 1998.

In some ways the rulers of the United Arab Emirates appear to have studied history and learned how to positively shape the destiny of this young nation. Raphael's painting honours creativity, innovation and achievement. It celebrates those who advanced science, medicine, engineering and human wellbeing in general. At the American University of Sharjah we too take the mandate to improve the human condition seriously. At CAAD we aim to help change this society from an economy that imports creative content to a society that creates relevant content locally. In that sense, this project makes a meaningful contribution.
Figure 2. Divya Mahadevan, Farah Monib, Zahra’a Nasralla, Gopika Praveen, Tasnim Tinawi, Uthra Varghese, Nabeela Zeitoun, *Redressing the Renaissance*, Sharjah, Unites Arab Emirates, 2018, Digital Compilation

But more than a mere re-enactment, the students created an artwork in its own right. It is a statement that challenges the canon, argues stereotypes and redirects the debate. The arrangement debunks Renaissance notions in post-modern fashion. High and low culture hierarchy is shattered. Commercial exploitation of an original product is avoided. The cult of originality, embodied in the single-minded grouchiness of Michelangelo, is replaced by cheery teamwork. The almost all-male cast in Raphael's fresco is rebalanced by plenty of women, in recognition of the gender ratio of the College's student body. High-brow pretensions of the fine art of painting – a solitary affair of the lonely genius – are replaced by clever crafts, historically associated with women's work: the textile world, linked to weaving, tailoring and dressing. On the other hand, women's managerial skills are given a nod: the mainly female students multitask to organize the majority male faculty.

The *Redressing*, as the students named their creation, counters global dispersion by grounding the locale firmly on the Sharjah campus of the university. The library lent the arch. The dome was digitally appropriated from a classroom building. The arcade was borrowed from those that front our academic buildings. Contemporary media of art-making are given their due. The all in-house production benefitted from students’ excellent IT skills and infrastructure. The Photoshop work alone required a 5GB file.

The colonialist assumption of western/white superiority is confidently rebuked by parading a competent phalanx of minority actors and protagonists of color. Local cultural norms are respected: Raphael's naked Apollo got dressed. The universality claim inherent in Roman Catholicism is challenged by a cast that includes, among others, Hindus, Protestants, Muslims and agnostics.

If I were asked if such a laudable effort should not be given course credit, I would counsel: definitely not. The brilliance of this project depends to a great extent on a spark of creative genius which alighted a communal flame for a momentary and strictly temporary appearance. It carries the serendipity of a falling star. Loading it with schedule and credit would extinguish the magic.
Acknowledgements
The project was conceived and executed in April 2018 by seven architecture students at the American University of Sharjah: Divya Mahadevan, Farah Monib, Zahra’a Nasralla, Gopika Praveen, Tasnim Tinawi, Uthra Varghese, Nabeela Zeitoun, Photo: Aashish Rajesh, Editing: Tasnim Tinawi, Logistical Support: Office of the Dean, College of Architecture, Art and Design.

About the Author
Born and schooled in Germany, J. Martin Giesen started to paint at age 15. After school he studied art history at Heidelberg University. For a year he interned at the Metropolitan Museum of Art in New York followed by completion of a PhD. With marriage and children, Giesen entered into a career of university teaching. He has taught in Lebanon (AUB 1973-85), Saudi Arabia, Canada, and since 1997 in the UAE, where he was founding dean of the School of Architecture & Design at the American University of Sharjah. For some 35 years, Giesen has produced and exhibited watercolor paintings documenting the impact of development on the environment. His paintings produced in Lebanon during the years of the civil war received critical acclaim. Work has been shown in solo exhibits in Lebanon, Germany, Canada and the UAE. David Tannous, Washington corresponding editor for Art in America, called Giesen a “contemporary orientalist”. John Munro and Samir Sayegh authored monographs, published in 1984 and 1995, on Giesen’s Lebanese watercolors. Giesen continues to teach art history at the American University of Sharjah.
Positive Impacts and Limitations of Mobile Learning as a Tool to Prepare Children to Reduce Risk of Disaster in case of Earthquake in Southeast Asia and Latin-America: The Case Study of the Application “Tanah: The Tsunami and Earthquake Fighter”

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Abstract

In recent decades, the occurrence of natural disasters has increased significantly at the global level. The United Nations Office for Disaster Risk Reduction (2013) considered that an estimate of 100,000 lives are lost each year due to natural hazards and, it is anticipated, that the global cost of natural disasters will exceed $300 billion annually by 2050. Latin America together with Southeast Asia are two of the regions that are particularly prone to disasters, even more when talking about earthquakes and tsunamis. According to the International Council for Science Regional Office for Asia and the Pacific (2008), more than 95% of earthquake energy is released in these two regions. One of the key factors of vulnerability is age. The inclusion and empowerment of children and youth, through activities/games, can support in building resilience in a community (UNICEF, 2011). Following this, UNESCO, supported by the Red Cross and the United States Agency for International Development, created a mobile application “Tanah: The Tsunami and Earthquake Fighter” in order to engage users to learn and convey the key lessons effectively on how to protect themselves from earthquake and tsunami. The initial application was released in November 2015 and was translated to Spanish and launched in Ecuador in October 2016. This paper argues for more evidence-based and transdisciplinary research before launching these types of projects and gives recommendations on how to improve disaster risk reduction games, based on the feedback made by the stakeholders involved in the design and implementation of the application.

Keywords: Mobile learning, disaster risk reduction, earthquakes, education for sustainable development

Introduction and Literature Review

Education is an essential tool for achieving sustainability. This vision is captured by the proposed SDG 4 “Ensure inclusive and equitable quality education and promote life-long learning opportunities for all” and its corresponding targets (UNESCO, 2016). UNESCO considers that the implementation of Education for Sustainable Development (ESD) is an enormous task and responsibility that cannot be carried only by formal education. The non-formal educational sector and the informal educational sector of the educational community must work cooperatively with the formal educational sector for the education of population at all scales. As recognized by UNESCO (2012a), emerging technologies are having significant impact on teaching and learning. In the last years, there has been a widespread proliferation of mobile phones. Pew Research Center (n.d) identified that in 2012, 87% of the world’s population had a mobile phone. Ferry (2009) specified that modern smart phones can improve accessibility to web-based content and encourage learners to share it, collaborate with others, and create media-rich deliverables, which is an important part of all learning processes.
UNESCO defines mobile learning as the type of learning facilitated by mobile technologies. Mobile learning represent accessibility because mobile phones are significantly less expensive than other devices like laptops and tablets, and considering that there is a large number of teachers and students that already own a standard mobile phone or smartphone worldwide, it may reduce costs associated with equipment and training when implementing mobile learning programmes in schools. UNESCO (2012a) identified that mobile learning provides continuous, affordable and easy access to educational content, resources and applications. Disaster risk reduction is considered to be a vital element for a sustainable development, even more in developing and least developed countries which are the most vulnerable to climate induced disasters. In the case of earthquakes, the hazards originated by these are beyond human control, reason why the only way to reduce the risk is by increasing the capacity of potential victims to cope with the impact of the potential earthquake. This can only be made through education for disaster preparedness (Jimee, Upadhyay & Shrestha, 2012).

Seismic vulnerability in Latin America
Chavez, etal. (2012) considered that Latin America is the “longest continuous oceanic-continental subduction system in the world due to its location (astride three of the world’s great fault systems)”. There is a tectonic compression resulting from of the convergence of the Cocos, the Nazca and the Antarctic plates with the North American, Caribbean and South American plates (Figure 1), which is responsible for the chain of mountains and active volcanoes that characterize the region. This plate boundary is the cause of the largest earthquakes in the region. In addition to this, the region is also in the Circum-Pacific belt or Ring of Fire (Figure 1), where at least 90% of all earthquakes occur, according to Gupta (2006) and National Geographic Society (n.d).

![Plate Tectonics](http://geology.com/plate-tectonics.shtml)
The increasing urbanization and the large populations of the cities of the region makes a large number of people vulnerable to geological hazards. As pointed out by the Swiss Reinsurance Company Ltd. (2014) the total number of people potentially affected by earthquakes is rather big in some of the largest cities in the region such as Lima (Peru), Santiago and Valparaiso (Chile), Mexico City and Guadalajara (Mexico), Bogota (Colombia), Buenos Aires (Argentina), Caracas (Venezuela) and Quito (Ecuador).

Seismic vulnerability in Southeast Asia
Southeast Asia is one of the most complex seismic zones in the world. The Pacific, Eurasian (Sunda), Australian, and Philippines tectonic plates converge towards or slide past each other at rates ranging from 5 to 10 cm per year (AIR Worldwide, 2015), in addition to the plate fringes where the Eurasian plate subducts under its neighboring plates (Noorliza Lat, 2007). The region has a high potential of experiencing seismic activity, as it is surrounded by zones of active boundaries. Most of the earthquakes in this region are concentrated in the subduction zones, expanding ridges and fault areas and are of tectonic origins (Noorliza Lat, 2007). Petersen, et.al. (2007) recognized that thrust-fault earthquakes are produced on the interfaces between plates in the Sunda subduction zone which extend down to depths of hundreds of kilometres within the subducted and shallow India and Australia plates, as well as shallow seismicity is evident within the upper 30 km of the overriding Sunda and Burma plates.
As experienced in the Latin American region, the increasing vulnerability to earthquakes and other geological disasters in Southeast Asia falls under the fact that there are about 742 million city dwellers in the region located in multi-hazard hotspots (UNESCAP, 2015a). The Swiss Reinsurance Company Ltd. (2014) has perceived that there is an important aggregate number of people potentially affected by earthquakes in Jakarta, Indonesia and Manila, Philippines.

**Methods**

The present study is a qualitative research built on a dual methodology with an in-depth analysis and triangulation of primary and secondary data aiming to assess and understand the potential of utilizing mobile learning as a tool to reduce risk to disasters, like earthquakes and tsunamis, in children in Southeast Asia and Latin-America.

As primary data, the research used:

1. The illustrative description of the launch of the mobile application “Tanah: The Tsunami and Earthquake Fighter” in Southeast Asia and Latin America:
2. Observation, notes and description on the development and implementation of these projects while doing an internship in UNESCO Bangkok (August 2015-February 2016) and in UNESCO Headquarters in Paris, France (September 2016-December 2016).

The secondary sources of information were previous research, official statistics, mass media products, government reports and historical data. This information was used to identify the challenges of accessibility in Southeast Asia and Latin-America, as well as to understand and contrast the countries’ specific environmental, cultural and historical context and their socio-economic vulnerability in order to appraise the significance of developing and implementing this type of programmes raising disaster risk reduction awareness.

The triangulation of information was categorized in a Five-Tiered Approach to Program Evaluation, as used by Callor, etal. (1997), with a view to identify and analyse the organizational issues in the design and adoption of a mobile learning game and its integration with existing practices in the regions of Southeast Asia and Latin-America. This methodology was used by conducting open-ended qualitative interviews at several levels, as identified in Annex I.

For this research, Program Definition, Accountability and Understanding and Refining are shown together, and Program Impact was addressed in the conclusions.

The interviews were conducted informally during the internships in UNESCO Bangkok and Headquarters. Additionally, several questions were asked via professional e-mail and Skype considering the different countries where the stakeholders are based.
Results
Program Definition, Accountability and Understanding and Refining

In December 1, 2015, ‘Tanah: The Tsunami and Earthquake Fighter’ was created as a disaster preparedness educational mobile app designed for children to raise awareness disaster risk reduction awareness while solving interactive challenges and puzzles. The application targeted young children in an age group of primary school in a beginning, according to HyunKyung (Jasmine) Lee from UNESCO Bangkok, but it intended also to include “both children and their families” considering that the application was accessible, free of charge and used appealing technology that children enjoy (Elspeth McOmish, UNESCO Santiago).

‘Tanah’ was created in collaboration between the Global Disaster Preparedness Center (GDPC), UNESCO-Bangkok, and USAID with support from Indonesian Red Cross (PMI) and ASEAN Coordinating Center for Humanitarian Assistance on Disaster Management (AHA Center), and developed by Opendream, a software company from Thailand. Up to May 2018, the application could be downloaded for free in English, Bahasa Indonesian, Nepalese, Spanish and Thai from Google Play and iTunes stores.

The game has 20 levels encouraging players to respond accordingly and appropriately to different scenarios and situations, by engaging through the main character, Tanah, and her dragon Pado, children will learn to prepare and protect themselves in case of an earthquake and tsunami. The application has “eye-grabbing visuals to keep gamers, especially young ones, engaged” (UNESCO, 2016).

Javier Córdova, coordinator of the initiative in Ecuador “More education, less risk”, explained that in the first 7 levels, the game encourages prevention by showing and helping kids recognize emergency alarms, signs, etc. From levels 8-14, the game teaches how children should respond to these types of events. Finally, the rest of the levels show the recovery aspects after an earthquake or tsunami.

According to HyunKyung (Jasmine) Lee, UNESCO Bangkok, the game was designed and based in “Public Awareness and Public Education for Disaster Risk Reduction: a guide” (2011) and “Public awareness and public education for disaster risk reduction: key messages” (2013) published by the International Federation of Red Cross and Red Crescent Societies.

Consequently, on October 11th, 2016, the initiative “More education, less risk”, implemented by UNESCO in partnership with Save the Children and Plan International, with support of the EU Humanitarian Aid and Civil Protection, launched the Spanish version of the game.

The launch was carried out in the “Colegio La Condamine” in the capital of Ecuador to support the recovery and education efforts after the earthquake that occurred on April 16th, 2016, and as part of the commemorative activities on the “International Day for Disaster Reduction” in October 13th 2016.

HyunKyung Lee, UNESCO Bangkok, informed that as of 19 June 2017, 96,000 people downloaded the application. According to Elspeth McOmish, UNESCO Santiago, 11,847 children downloaded the Spanish version of the game.

In the long-term, Elspeth McOmish, UNESCO Santiago, expects that the Spanish version of the game will directly reach and benefit at least 25,000 users. HyunKyung Lee, UNESCO Bangkok identified that the team that worked on the design and development of the game hopes that that a number of population in Asia-Pacific region would have a chance to enjoy this application and to learn basic lessons. Both experts considered the application is reaching the expected results because:

- “It responds to a need (play-based learning on DRR for young children) that was not filled” Elspeth McOmish, UNESCO Santiago
- “The number of downloads of the application is gradually increasing which shows there are a number of users who are interested in learning about tsunami and earthquake disaster.” HyunKyung Lee, UNESCO Bangkok
Understanding and Refining

For the section of “Understanding and Refining” the present research aimed to gather “program satisfaction data, process data, and identifying “lessons learned” that can be used to refine and modify the program”.

During the data collection, it was evident that even if the results have been positive according to the developers and programme managers, there is no specific strategy for monitoring, reporting and evaluating the application, the learning and personal experience and the satisfaction of the audience (as of October 2017).

The application that predeceased Tanah, “Sai Fah: The Flood Fighter” was evaluated in 2015 considering the number of downloads and the number of countries it was downloaded. This last application, after a year of its launch, was downloaded 100,000 times in 140 countries. Currently, as informed by UNESCO Bangkok and UNESCO Santiago, as of 19 June 2017, 96,000 people have downloaded the application in different languages, from which 11,847 have downloaded the Spanish version of the game.

According to Attwell (2006) and Alowayr & Badii (2014), e-learning and innovative approaches to learning, such as Tanah’s application, has several challenges to overcome, one of them is that it has been limited by the shortage of scientifically credible evaluation to track the performance, the types of intervention and interactions and satisfaction of learners.

Progress Toward Outcomes

The first issue to be analysed and compared to the information collected from the developers and UNESCO specialists is on the accessibility or ubiquity of mobile technology. Conejar & Kim (2014) identified that mobile devices provide “unparalleled access to communication and information” to our daily lives. Even more specific, when talking about learning and education, mobile technology enables access to learning anytime and anywhere because the devices are easily portable, more affordable and easier self-procured and managed (Murshidi, 2017).

On the last decade, access to mobile devices has been increasing, even more in developing and least developed countries. As said by Sharma & Lucini (2016), ten years ago only one fifth of the world’s population had access to a mobile device, but in 2017 it was calculated that around half of the global population had that benefit.

In developing countries, the rates of mobile technology adoption have increased exponentially because devices are more affordable and easier to use. The World Bank (2012) estimated that, the last decade, the global mobile subscriptions in use grew from less than 1 billion in 2000 to over 6 billion in 2012. Just in 2011, more than 30 billion mobile applications were downloaded.

According to Pew Research Center (2015), in emerging and developing countries, a median of 84% own a cell phone. However, the ownership of a smartphone would be considerably less (a median of 24%) and is mostly between the most educated population. For example, in the regions this research is studying, diverse research shows that there are different barriers for the adoption and access to internet and mobile technology.

Sharma & Lucini (2016) considered that in Latin America, there is insufficient infrastructure and a limited supply of attractive content which is considered a threshold that increases digital inequalities among the region. On the other hand, in Southeast Asia, Jeroschewski et al. (2015) identified some factors that hinder the penetration of mobile broadband such as the lack of knowledge about the availability of mobile internet and the services offered by the companies and the lack of availability of smartphones and/or phones with internet access.
For both regions, affordability is also considered one of the most important challenges and limitations that the population faces when accessing to mobile devices. In Latin America, Sharma & Lucini (2016) identified that the cost of mobile ownership is on average 17% of the income for the most vulnerable people. Southeast Asia differs from the Latin America region in this sense as there are roughly as many mobile subscriptions as population, however these figures don’t show the access to smartphones and tables (devices able to download applications and access to Internet).

In Southeast Asia, as said by Farley & Song (2015), Jeroschewski et al. (2013) and Deibert (2012), mobile, broadband, and computer penetration can be seen in three distinct levels:
- High level in Brunei, Malaysia, and Singapore;
- Medium level made up of the middle-income countries such as Indonesia, the Philippines, Thailand, and Vietnam, having high levels of mobile usage but very low levels of broadband internet and computer use;
- A third group which have low levels of mobile, broadband internet, and computer penetration with countries such as Cambodia, Laos, and Myanmar.

Regarding internet connection and access to it, the Asian Development Bank (2017) recognized that globally we can find 3.4 billion internet users who access “the internet through personal computers, tablets, and around 1.4 billion smartphones”. However, Internet access differs substantially across developed, emerging and developing countries.

In Latin America, for instance, in 2015, the Economic Commission for Latin America and the Caribbean (2016) reported that 54.4% of the inhabitants of Latin America and the Caribbean were able to use Internet, which is 20% higher than the figures shown in 2010. However, mobile broadband coverage is still a challenge in remote areas (mountain ranges, rainforests and islands), where at least 64 million people are still lacking this service (Zhang, 2017). As shown by Farley & Song (2015), in Southeast Asia, poor infrastructure, due to the lack of private investment, restricts broadband internet penetration. In addition, some countries such as Myanmar, Cambodia, and Laos also experience lack of access to electricity which also limits the use of computer technologies.

In the Latin-American region, education is a key factor that explains accessibility to Internet. GSMA Intelligence (2017) identified that “well-educated access the internet at rates of 50 percentage points or more than less-educated people access”. In Chile, for example, from the people who have access to Internet connection, 87% have more than a secondary degree.

As recognized by UNESCO (2011), digital literacy is a life skill that enables the acquisition of other important life skills. This concept “comprises a set of basic skills which include the use and production of digital media, information processing and retrieval, participation in social networks for creation and sharing of knowledge, and a wide range of professional computing skills”. In regions, such as the Latin American and the South East Asian, there is a gap in digital literacy and skills which attenuates social inequalities (UNESCO, 2014).

In Latin America, for example, even though basic literacy rates are higher than the global average (Sharma & Lucini, 2016), as identified previously, indicators on computer access in schools in the region show that there is still a gap between countries when talking about ICT access in schools, which can go from 90% in some Southern Cone countries such as Chile to 19% in Peru (UNESCO, 2014). Nevertheless, the regions have been working in creating new and innovative public education policies related to ICTs, resulting, as reflected by UNESCO (2014), in a similar computer access to the OECD average on 15-year old’s.

Sunkel et al (2011) recognized that in Latin America, the main use of ICTs by students is recreational. This shows how games and applications, such as “Tanah” could encourage children to learn how to reduce risk in an innovative, fun, informal way.

Unfortunately, not much information about general digital literacy was found about Southeast Asia. Most of the reports and information found highlighted the importance of digital literacy and access to internet to bridge
knowledge gaps. Additionally, organizations such as the Organisation for Economic Co-operation and Development recognized that digital literacy should be part of the policy reform priorities (OECD, 2018).

Conclusion
After data collection, this research assessed positive impacts and limitations of utilizing mobile learning as a tool to reduce risk in case of earthquakes in children in Southeast Asia and Latin-America. In order to do so, first we need to understand the boundaries and positive effects of mobile learning by itself.

Online learning has several benefits, even more when it complements face-to-face learning, as said by the Asian Development Bank (2017). Hopeton (2009) recognized that, “if made more accessible, mobile internet could help bridge information and education gaps experienced by the financially impoverished majority”. However, we can’t forget that accessibility, both to internet and to mobile technology, is and will continue to be a challenge in the next years.

As identified by Zhang (2017), in Latin America 250 million will not have access to digital technologies by 2020. This highlights how the access to mobile learning applications, such as Tanah, will continue to be unequal and will predominantly exclude the population from rural areas, in lower income classes and more likely to be women. It is important to consider that even if mobile technologies are more affordable than both broadband internet and desktop or laptop computers, these types of technologies still provide a significant cost for many people with lower income (Farley & Song, 2015).

This research would recommend UNESCO to collect and assess information on the users who download the application, specifically information that would be helpful to understand who is downloading the application (education level, gender, location) and how could they improve in the future the accessibility to these type of learning devices to other sectors and actors.

UNESCO (2013) recognized that educational apps, such as “Tanah: The Tsunami and Earthquake Fighter” are already experiencing significant growth in developed countries, due to the innovative distribution mechanism for content, and the investment in software development. However, this doesn’t mean that developing and least developed countries, such as the ones on the regions we studied, have the experience the same growth.

When talking about education and specifically mobile learning that aims to reduce risk for disasters in countries in Latin America and South East Asia, this study recognized that it is necessary to choose the right technology (considering social and geographical aspects such as country, context, culture, infrastructure needed) and build the capacity of the people who will use the technology and maintain it. Engaging with teachers and students during the events organized by UNESCO to promote the application is a good starting point, however questionnaires and short interviews could provide specific evidence on the acceptance, effectiveness and engagement of the users.

One more issue identified while analysing the data collected is that efficient planning of any e-learning project should previously develop high-quality research to obtain sufficient data and information regarding the “supporting information technology (IT) infrastructure, including the people, processes, and technology” to assess the viability of the project (Pouezvara, Mekhael & Darcy, 2014). Mapping the potential users according to the type of infrastructure (accessibility) and comparing it with the goals and objectives of the application could be beneficial to understand the needs, the context and potential benefits of launching an e-learning programme, such as Tanah in a specific location.

To address these issues, this research would recommend to develop tools and methods to identify and map the available information before developing the applications. Involving local social science and natural science researchers or research institutions is highly recommended. Understanding the funding limitations that UNESCO and other international organizations have for evaluating and monitoring projects like Tanah, as shown in Annex I, it is recommendable to utilize existing research, literature, studies and resources such as maps. Annex 1 contains the map of the pattern of internet access in Mexico by State (2013) shared by Geo-Mexico and the map of the more than 6 magnitude earthquakes in (2016-2017) which is accessible for anyone. By comparing both
maps, we can recognize that only 3 of the 8 cities/towns/communities where an earthquake of more than 6 magnitude happened, are located in states where 20-30% of the households have access to internet. The 5 remaining communities are located in states where less than 20% of the households have access to internet. This information and data is of great importance to develop successful promotion campaigns in communities that have access to internet and with population that could easily relate to the game because of their prevailing experience with earthquakes.

Furthermore, as a way to bridge the social and gender gaps in accessibility in Latin America and Southeast Asia identified during the present research, more localized studies and research on cultural and/or gender resistance to online learning technologies, especially to games, should be developed. During the data collection, it was evident that there is a limited number of researchers working on the tangible results from online learning and gamification, even more on the culture and/or gender resistance to online learning. Developing new, high-quality, context based and updated knowledge on the topic is necessary to create more effective games and applications that can successfully reduce risk of earthquakes and tsunamis in children in the region. Figures on access to mobile devices and smartphone ownership are mostly based on data collected on urban areas (Farley & Song, 2015). More detailed research on access to mobile devices and internet is needed on the regions. This type of research would be useful to develop future strategies on mobile learning that consider populations on remote and rural areas.

Additionally, to achieve more and better results, monitoring and evaluation needs to be considered and budgeted as part of any programme or project. There is a lack of high-quality data that can be obtained from the developers after signing off the project, limited to number of downloads and countries where the downloads were generated. Additional on-line data should be generated such as knowledge-based learner performance, learning experience and satisfaction. Even when on-line data gathering, and audience perception questionnaires could be easily created and included at the beginning, during and at the end of the game, the devices to record and analyse usage by duration and frequency, or consultants to interpret and analyse the data would have an additional cost. It would be important to consider this issue while creating any e-learning project’s budget.

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Social Network Analysis of European Union Energy Projects and their Impacts of on Regional Development

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Abstract

Energy is crucial input for economic competitiveness of the EU industry and employment and energy research is at the heart of combating climate change as well as providing sustainability for human life and affordable prices for the market. Therefore, the EU’s energy policy aims to give EU consumers access to secure, sustainable, competitive and affordable energy. Since European Framework and Horizon 2020 programs are the main instruments addressing research and innovation to develop breakthrough technologies and solutions in order to achieve EU’s strategies, the calls for energy field are expected to supports EU’s energy policy objectives. One of the objective of this paper aims to conduct social network analysis for 7th framework and Horizon2020 energy projects to investigate network performance of participants in country and regional dimensions and compare how regional networks evolve in terms of NUTS2 level. Though it is difficult to investigate such a concrete comparison since Horizon2020 projects are ongoing initiative so apart from analyzing evaluation of NUTS2 regions, another objective of this paper is to conduct deeper social network analysis of FP7 Energy projects in country level and regression analysis which investigates the factors depending on project externalities. It is found that the top NUTS2 regions contain projects located in the center of network however there are important participants with high degree centrality and low betweenness centrality which draw into collaborate with participants with higher geographical proximity. Despite the fact that the top performer regions persist over the years structural convergence have higher degree and betweenness centrality among the projects in less developed regions, the projects located in structural hole regions are deceive for knowledge flow on the network. In addition, after the analysis, the study will be novel in terms of suggesting strategic knowledge cohesion strategy enhancing Europe energy network and stressing knowledge flow structure in order to strengthen the competitive power of projects for European Union.

Keywords: EU Framework Projects, 7th FP Energy projects, regional development, social network analysis, EU energy policy

Introduction

European Union energy policy targets strategies for 2020 and 2030 on fundamental issues which are securing energy supplies, Expanding the internal energy market, increasing energy efficiency, reducing emissions and decarbonizing the economy, supporting research and innovation.¹ There have been energy market challenges in worldwide which stresses energy transition in contemporary power systems, renewable energy systems, storage, interconnections and XB trade. Technology change in energy systems is coming as disruptive technologies in most of the fields such as wind and solar is replacing thermal (nuclear and fossil), learning curves and price drop for new technologies in batteries and storage, growth and change in energy market regularities. In addition to strategies for secure, affordable and sustainable energy, EU energy policy includes legislation mechanisms such as regulations, directives, and decisions. Therefore, EU adopted directives and regulations to ensure deregulation the internal market for gas and electricity, renewable energy national targets, energy efficiency targets, development of energy infrastructure and safeguards against gas supply disruptions. (DG Energy, 2016)

The aim of this paper is much related to existing findings in the literature which have already revealed that important countries in EU’s programmes however it has novel methodology and findings in investigating network performance of participants in country and regional dimensions and compare how regional networks

¹ https://europa.eu/european-union/topics/energy_en
evolve in terms of NUTS 2 level. Since it is difficult to investigate such a concrete comparison between 7th FP energy and Horizon 2020 energy projects because not all of the H2020 projects have been completed. Thus, another objective of this paper is to conduct deeper social network analysis of FP7 Energy projects in country level and regression analysis which investigates the factors depending on project externalities.

This paper aims to discuss how 7th framework energy projects affect at regional level within European Union in general. In order to do so, section 2 introduces how network performance and regional development have relation with each other. Section 3 describes how the data gathered and the analytical attempt of methodology. The empirical results of the paper are given in section 4 through social network analysis and regression analysis. The findings are summarized in the conclusion.

Network Performance and Regional Development

The relevance of collaborative research networks have been consisted as an influential factor on EU’s regional competitiveness and specifically innovation performance in many studies has been a matter of analysis in economic, geographic and management literature. Additionally, collaborative research networks have been knowledge transfer mechanisms which spatial proximity of actors do not importantly require to build knowledge channels but social and relational proximities to build and maintain necessary level of trust between researchers. (Autant-Bernard, Billand, Massard 2007; Basile et al 2012, Sebestyen, Varga 2013)

Aside from the empirical studies, Napiórkowski (2017) examines the impact of the Framework Programs on innovativeness in the European Union and how these programs have been translated into innovation output in macro level by including the role each of the key innovation actors plays from the perspective of FP7 and H2020 funding and how this translates into innovation output. Yet is is found that FP7 is a set of programs, which result in a stimulation of the creation of IPRs and knowledge creation and decimation, but weaker in terms of commercial implications. Therefore, EU built H2020 programme to overcome these issues to some degree.

H2020 have been contributed to an increase in the level of innovativeness in the EU, however not all programs are equally efficient in achieving the final goal of a given innovation output. (Napiórkowski, 2017) Apart from analyses in country and NUTS2 levels, it is generally addressed that top performers in FP7 and H2020 programs are private companies and research organizations which consist of big companies and reputable public organizations. Therefore, this study will address the crucial participants, projects and NUTS 2 level regions in the network analysis to show the funding of EU programmes really make a change through time by evaluating both FP7 and H2020 programmes. In order to analyze actor’s network performance, for example Cong et. al (2017) investigate the relationship between embeddedness, knowledge management and technological innovation performance in the network and found that embedded structure broadens the channel of knowledge and structural holes may improve the possibility of heterogeneous knowledge acquisition. another study about structural holes suggests that higher absorptive capacity enables structural holes at innovation systems by the involvement of social capital of actors in the network because it is found that absorptive capacity can play a significant role as a capability that aids knowledge transfer in the regional innovation system. (Kallio, Harmakorpi, & Pihkala, 2010)

Since there is a lack of links combining regional development and network performance in the literature, (Uotila & Ahlqvist, 2008) proposed a synthetic knowledge infrastructure model including innovation policy in order to provide regional development strategy in the network. Regions with synthetic knowledge infrastructure should strengthen localized learning of existing industrial specialization and promote technological trajectories based on interactive collective learning by enhancing brokerage opportunities to maintain knowledge accumulation.

Moreover, Graf and Krüger (2011) examine the impact of actor’s positions within regional innovator networks on their innovation performance and found out that not all gatekeepers are able to reap benefits of brokering positions. It is stated that in individual level being a gatekeeper which is characterized by multiple internal and external contacts matters for innovative success.
Another key studies suggest that local networking local collective learning depend increasing brokerage activities, shortened path length and high clustering coefficient. (Belso Martínez, 2017; Ter Wal, 2011) Furthermore, (Cong, Zou, & Wu, 2017) claims that embedded network structure and high network density increase knowledge integration which lead to enhance knowledge management capability.

The studies about centrality measurement have important findings about network performance and local characteristics of regions. Researches highlight that regional agglomeration shapes the character of information and resource flow through networks and high centrality metrics are signs of bridging strong ties and intense collaboration. (Whittington, Owen-smith, & Powell, 2009; Eklinder-Frick, Eriksson, & Halln, 2014)

The discourse within marketization phase of EU’s programmes largely concentrated on the domestic firms and their interaction with international joint ventures. (Shi, Sun, & Peng, 2012) emphasized that the level of marketization affects differently to the network structural attributes, therefore, needs to be integrated into regional network analysis. When marketization is high, centrally positioned domestic firms are more likely to be selected by foreign entrants as international joint venture. On the other hand when marketization is low, domestic broker firms are more attractive as international joint venture partners. Therefore, importance of network positions changes depending on developed or emerging economies. In developed economies, the firms with high centrality are preferred as attractive partners. However, if in emerging economies the firms holding structural hole position or brokerage positions are preferred as attractive partners.

Data and Methodology

Section 3.1 presents how the raw data collected from FP 7 (2007-2013) and H2020 (2014-2020) and the raw data processed in this paper in three parts. Section 3.2 explains the methods used to analyse the data in two different parts.

Data

Data for Social Network Analysis of FP7 and H2020 Energy Projects

Throughout this study, a large number of indicators available in CORDIS database were used to map networks of FP and H2020 networks and measure network performance of these networks both in country and NUTS 2 level. There are overall 258 projects signed for energy calls and 101 of them were completed including 965 participants between 2007 and 2013. The count of distinct NUTS 2 regions of these participants is 184. There have been 982 number of energy projects ongoing with total 6652 participants at H2020 energy projects. 69 of the projects have been completed. The count of distinct NUTS 2 regions involved all participants on each project is 316. Using the above data combined with results of the retrieval of NUTS2 regions of participants, it is found that there are more participants from outer side of London and France, Western Austria, Poland and Turkey (especially outside of TR10) in Horizon 2020 projects.

Data for Explanatory Analysis of FP7 Energy Projects

7th FP Energy projects are examined into NUTS2 level for exploratory data analysis in order to analyze whether there is a relationship between independent and dependent variables. The independent variables can broadly categorized how they were calculated. Number of participants and diversity rate are computed from raw data. Diversity rate, degree centrality of regions, normalized degree centrality of regions and betweenness centrality are computed from social network analysis metrics. Project coordinator in Web of Science is a categorical independent variable which represents 1 or 0 if any project coordinator who has a publication in Web of Science exists in that NUTS2 region. FP projects may have their own webpage for their projects except from their CORDIS webpage. Webpage status of FP7 energy projects is scanned through web and it is used as categorical variable in data analysis. Human Resources in Science and Technology and Gross domestic product (GDP) of each NUTS 2 region are included as dummy variable to control SNA and other data are explanatory for independent variables.
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<tr>
<th>Independent Variables</th>
<th>Calculated as</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of participants</td>
<td>Nominal variable: Number of participants are calculated by summing up all participant ID in that region without eliminating whether they are in the same project or not.</td>
</tr>
<tr>
<td>Diversity Rate</td>
<td>Nominal variable: Diversity rate is calculated by dividing representative project participant to total number of participants in that specific region. For example, if there is total 4 participants from a NUTS2 region but 3 of them are from the same project than diversity rate of that region is 0.5. (diversity rate= 2/4)</td>
</tr>
<tr>
<td>Degree Centrality of NUTS2 regions</td>
<td>Categorical variable: The regions are divided into low, medium and high according to the median of degree centrality.</td>
</tr>
<tr>
<td>Normalized degree centrality of participants in each NUTS2 region</td>
<td>Nominal variable: each participant degree centrality is summed if they are in the same NUTS2 region and normalized degree centrality is calculated by dividing the total degree centrality to the number of participants in the same region.</td>
</tr>
<tr>
<td>Betweenness Centrality</td>
<td>Nominal variable calculated from NUTS 2 network</td>
</tr>
<tr>
<td>Project coordinator in Web of Science</td>
<td>Categorical variable if any project coordinator exists in that NUTS2 region</td>
</tr>
<tr>
<td>Webpage Status of FP7 Energy Projects</td>
<td>Categorical variable if the project website is active web or not active</td>
</tr>
<tr>
<td>Human Resources in Science and Technology (Dummy Variable)</td>
<td>Nominal variable retrieved from Eurostat</td>
</tr>
<tr>
<td>Gross domestic product (GDP) (Dummy Variable)</td>
<td>Nominal variable retrieved from Eurostat</td>
</tr>
</tbody>
</table>

CORDIS link of the projects have access to open aire database for their scientific publications and first dependent variable is publication number of each project which is retrieved directly from CORDIS database linking to OpenAire platform. Second dependent variable is share of regional patent indicator. Regional patent indicators with respect to EU’s climate change mitigation technologies related to buildings, climate change mitigation technologies related to energy generation, transmission or distribution and capture, storage, sequestration or disposal of greenhouse gases are retrieved from Eurostat Regional Patent Database. ([https://stats.oecd.org/Index.aspx?DataSetCode=PATS_REGION](https://stats.oecd.org/Index.aspx?DataSetCode=PATS_REGION)) The data is available for mostly NUTS2 region and NUTS3 regions. To calculate NUTS2 region patent indicator, all the indicators in NUTS3 regions are calculated and divided by the number of available data count.
27300 number of publications are retrieved from Web of Science which are all belong to European Union 7th Framework Projects by filtering funding options with all combinations of European Union 7th Framework Projects (FP7, EU 7th Framework Programme, EU FP7, 7th Framework Program). The data retrieved from Web of Science contains the information of authors, title, date of publication, journal name, subjects, keywords, objective, funding of publication. Therefore, among these 27300 publications, all coordinators of EU FP7 energy projects were searched by name and surname and 20 coordinators are found.

Methodology

Methodology of this paper consists of two parts which are network analysis of 7th FP and H2020 energy projects and exploratory data analysis of 7th FP NUTS 2 regions.

Firstly, in order to perform 7th FP energy network analysis and compute the network indicators; the different networks were constructed at country, NUTS 2 and 2-mode projects and participants described in Figure 1. In addition to these network analyses, the web of science publication network is constructed to investigate publication performance of FP7 energy projects. Web of science publication network and FP energy network derived from CORDIS are combined with unique project ID and the network indicators and other attributes were used to construct NUTS 2 level network and statistical analysis. Figure 1 shows connection of 7th FP Web of Science and project-participant dataset to construct NUTS2 level network analysis and regression analysis.

![Figure 1: FP7 Joining of datasets](image-url)
Since H2020 projects have started at 2014 and still most of the projects are going on, the outputs of these projects are not included in this research paper. Thus, the network results of H2020 energy projects compared with those of FP7 projects.

Overall, this paper provides social network analysis based on centrality measures, identifying structural holes and bridges to observe key performers in the network according to their corresponding position with other performers in both county, NUTS 2, and project-participant levels.

Results

FP7 Network Results

The coordinator with the highest degree centrality is from Germany, followed by the Netherlands, Italy, Greece, France, Norway and the United Kingdom respectively. These projects have structural equivalence with each other at the same time. Coordinators of the projects in the network center are from: France, Ireland, Netherlands, Germany, Spain, Greece and Italy. Apart from projects, the participants with the highest degree of centrality are from the United Kingdom, while the other high participants are from Germany, the Netherlands, Norway, Switzerland, Sweden, Portugal, Denmark, Croatia and France. Even though the degree centrality of Norwegian participants is high, they are collaborating among themselves rather than other countries. As a results betweenness centrality of Norwegian participants are low which means they are not located in the shortest paths of dense network sections. Another finding about degree centrality is that being a coordinator or a participant in the projects does not decisive about their degree centrality level.

The number of scientific publications was not related to the location of the project in the network. The projects that have high number of projects can be located either core or periphery of the network. However, the central projects mostly kept their webpages pages active.

Another important finding is that projects that receive a similar amount of grants are positioned at equal distances in network analysis. This may be result of their structural equivalence about their participants’ positions. According to Cramer V. Rajski coefficient, degree centrality has a determining role in the participant's country. Not surprisingly the top countries generally have higher ties according to developing countries.

Web of Science Network Results of FP7

Figure 3 depicts Web of Science publication network of coordinators of 7th FP energy projects. The size of vertices represents the co-authorship of publications, as the size gets bigger it means there are more authors in that publication. The network shows markedly the publications with more co-authorship located both in center and periphery of the network. Sebestyen and Varga (2013) found out a similar finding in their analysis which implies collaborative research funded by EU Framework Programs has a stronger influence on peripheral regions’ productivity in publications.
Regression Results of FP7

An exploratory data analysis is used for multivariate the correlations task to create bivariate scatter plots of variables and produce correlation statistics for 7th FP Energy Network NUTS 2 regional data which is described in Section 3 in detail. By default, SAS Enterprise Guide software generates the correlations task producing Pearson correlation statistics and corresponding $p$-values.

The Scatter Plot graphs are provided for the lowest $p$-value of independent variables which might have relationship explaining dependent variables. A strong correlation between two variables does not mean that change in one variable causes the other variable to change, or vice versa. Sample correlation coefficients can be large because of chance or because both variables are affected by other variables. However, the scatter plot right hand side in Figure suggests a positive linear relationship between regions’ patent indicator and number of participants from that region, and degree centralities of projects in that region. Moreover, the scatter plot left hand side in Figure suggests a positive linear relationship between the number of publications retrieved from CORDIS database and number of participants, having a project coordinator whose publication presents in Web of Science, degree centrality and website status of projects.
Figure 3: The scatter plot correlation matrix

Therefore, degree centrality of participants meaning that if participants have more ties with other participants causes positive linear relationship with both share of patent indicator and the number of publications of that region.

Comparison of FP7 and H2020 Network Results
In terms of general comparison of FP7 and H2020 networks, H2020 network is splitted into all and only completed project networks. Degree centralization of networks were examined in terms of project, participant and density of 2-mode network. Table 2 lists the metrics related to information flow and power in a network in terms of degree centralization and betweenness centralization. H2020 all energy network has the highest degree...
centralization which means project have more ties with other projects than other two networks. Participant network of three EU programmes, the metric does not differ so much. When degree centralization is examined in two mode network. The densest network is at H2020 completed energy network, this means there are the highest number of connections among all participants and projects. Furthermore, FP7 network has the highest betweenness centralization all in project, participant and 2 mode network which means that the nodes are closer and they locates at the shortest path between the knowledge flows.

Table2: Comparison of FP7 and H2020 Network Results in 2 mode network

<table>
<thead>
<tr>
<th>Metrics related to information flow and power in a network</th>
<th>FP7 Energy Network</th>
<th>H2020 All Energy Network</th>
<th>H2020 Completed Energy Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree centralization project network</td>
<td>0.07963</td>
<td>0.21344</td>
<td>0.01426690</td>
</tr>
<tr>
<td>Degree centralization participants network</td>
<td>0.16061</td>
<td>0.14811</td>
<td>0.15111111</td>
</tr>
<tr>
<td>Density [2-Mode]</td>
<td>0.0114092</td>
<td>0.00179937</td>
<td>0.01535371</td>
</tr>
<tr>
<td>Betweenness centralization project network</td>
<td>0.07839</td>
<td>0.01400</td>
<td>-</td>
</tr>
<tr>
<td>Betweenness centralization participants network</td>
<td>0.20624</td>
<td>0.10015</td>
<td>0.00264545</td>
</tr>
<tr>
<td>Betweenness centralization overall</td>
<td>0.20164</td>
<td>0.10023</td>
<td>0.00963060</td>
</tr>
</tbody>
</table>

Similarly, Table 3 lists the degree and betweenness centralization of FP7, H2020 All and H2020 completed energy network in NUTS 2 level. These metrics at FP7 are higher than H2020 program meaning that NUTS 2 regions at FP7 have more connections than they have at H2020 and these regions have shorter tie with other than they have at H2020. Additionally, the NUTS 2 regions at FP7 are more likely on the shortest path so knowledge flow can be easier because regions can reach to each other more easily than H2020.

Table3: Comparison of FP7 and H2020 Network Results in NUTS 2 level

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree centralization</td>
<td>0.545787</td>
<td>0.524031</td>
<td>0.21027</td>
</tr>
<tr>
<td>Betweenness centralization</td>
<td>0.087435</td>
<td>0.033871</td>
<td>0.06153</td>
</tr>
</tbody>
</table>

Degree centrality measures how much connections a node has with other nodes in the network. For example, FR10 is at the top of the Table 4 at FP7 column, this means the sum of the count of ties of participants belong to FR10 region is the highest among other regions. Betweenness centrality measures how often a node exists on the shortest paths among other nodes in the network.
Table 4 lists the top 10 EU regions according to network degree centrality and Table 5 according to betweenness centrality that shows how reachable a region is in knowledge flow in a network. FR10, BE10, ITE4, EL30, DE21 preserve their top performance positions through FP7 to H2020. There are three success stories within joining as top performers of H2020 in degree centrality list which are ITC4, NL33 and FI1B.

Table 4: Degree Centrality of NUTS2 Regions at FP7 and H2020

<table>
<thead>
<tr>
<th></th>
<th>FP7</th>
<th>H2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>FR10</td>
<td>Ile de France</td>
<td>ES30 Madrid</td>
</tr>
<tr>
<td>BE10</td>
<td>Brussels</td>
<td>FR10 Ile de France</td>
</tr>
<tr>
<td>DE21</td>
<td>Oberbayern</td>
<td>BE10 Brussels</td>
</tr>
<tr>
<td>ITE4</td>
<td>Lazio</td>
<td>ITE4 Lazio</td>
</tr>
<tr>
<td>NL31</td>
<td>Utrecht</td>
<td>ES51 Catalonia</td>
</tr>
<tr>
<td>ES30</td>
<td>Madrid</td>
<td>DE21 Oberbayern</td>
</tr>
<tr>
<td>EL30</td>
<td>Attica</td>
<td>EL30 Attica</td>
</tr>
<tr>
<td>PT17</td>
<td>Área Metropolitana de Lisboa</td>
<td>ITC4 Lombardia</td>
</tr>
<tr>
<td>NL32</td>
<td>North Holland</td>
<td>NL33 South Holland</td>
</tr>
<tr>
<td>NO01</td>
<td>Oslo Akershus og</td>
<td>FI1B Helsinki-Uusima</td>
</tr>
</tbody>
</table>

FR10, DE21, BE10, ITE4, ES30, EL30 regions still exist top betweenness centrality list on H2020 programmes as they did on FP7. NL31 lost its position but there is another Holland (NL33 South Holland) region took place in the list which is shown at Table 5. While DK01, PT17, DE12 lost their positions at top performers list, ES51, ITC4 and AT13 moved into list. As a result, EL 30 moved to the level of top performing regions and the regions of Spain and Italy located at shortest path of network compared to FP7.

Table 5: Betweenness Centrality of NUTS2 Regions at FP7 and H2020

<table>
<thead>
<tr>
<th></th>
<th>FP7</th>
<th>H2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>FR10</td>
<td>Ile de France</td>
<td>ES30 Madrid</td>
</tr>
<tr>
<td>DE21</td>
<td>Oberbayern</td>
<td>BE10 Brussels</td>
</tr>
<tr>
<td>BE10</td>
<td>Brussels</td>
<td>FR10 Ile de France</td>
</tr>
<tr>
<td>ITE4</td>
<td>Lazio</td>
<td>EL30 Attica</td>
</tr>
<tr>
<td>ES30</td>
<td>Madrid</td>
<td>ITE4 Lazio</td>
</tr>
<tr>
<td>DK01</td>
<td>Hovedstaden</td>
<td>ES51 Catalonia</td>
</tr>
<tr>
<td>NL31</td>
<td>Utrecht</td>
<td>DE21 Oberbayern</td>
</tr>
<tr>
<td>PT17</td>
<td>Área Metropolitana de Lisboa</td>
<td>ITC4 Lombardia</td>
</tr>
<tr>
<td>DE12</td>
<td>Kalsruhe</td>
<td>NL33 South Holland</td>
</tr>
<tr>
<td>EL30</td>
<td>Attica</td>
<td>AT13 Vienna</td>
</tr>
</tbody>
</table>

FP7’s structural holes are BE31 (Walloon Brabant), SK02 (Western Slovakia), PL63 (Pomorskie), DE26 (Unterfranken), AT33 (Vienna), DE92 (Hannover), DEG0 (Thuringen) and H2020’s structural holes are ES21
Participants in the broker are comprised of research centers and universities at FP7, those in this position have a higher network connection than the other group members. The countries of the participants in the broker position were France, Spain and Greece as local bridges. Brokerage as liaison gets the information from different group and pass it through again to another different group. In liaison position, broker mediates between members of different groups but he does not belong to these groups himself or herself. Zhang (2016) suggests that broker’s strength of connections depend on the number of structural holes in the network, from this point if we examine both structural positions and liaisons roles of regions, it can be concluded that major countries like Belgium and Germany, have strong liaisons positions at FP7 network and United Kingdom, Spain preserve their special regions as in liaisons positions at H2020 network.

Table 6: Liaisons as Brokerage Roles at FP7 and H2020

<table>
<thead>
<tr>
<th></th>
<th>FP7</th>
<th>H2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>FR10</td>
<td>Île de France</td>
<td>ES30 Madrid</td>
</tr>
<tr>
<td>BE10</td>
<td>Brussels</td>
<td>FR10 Île de France</td>
</tr>
<tr>
<td>DE21</td>
<td>Oberbayern</td>
<td>BE10 Brussels</td>
</tr>
<tr>
<td>ITE4</td>
<td>Lazio</td>
<td>ITE4 Lazio</td>
</tr>
<tr>
<td>NL31</td>
<td>Utrecht</td>
<td>ES51 Catalonia</td>
</tr>
<tr>
<td>ES30</td>
<td>Madrid</td>
<td>DE21 Oberbayern</td>
</tr>
<tr>
<td>PT17</td>
<td>Área Metropolitana de Lisboa</td>
<td>EL30 Attica</td>
</tr>
<tr>
<td>EL30</td>
<td>Attica</td>
<td>ITC4 Lombardia</td>
</tr>
<tr>
<td>NL32</td>
<td>North Holland</td>
<td>NL33 South Holland</td>
</tr>
<tr>
<td>NO01</td>
<td>Oslo og Akershus</td>
<td>UKI London</td>
</tr>
<tr>
<td>UKI</td>
<td>London</td>
<td>FI1B Helsinki-Uusima</td>
</tr>
<tr>
<td>DK01</td>
<td>Hovedstaden</td>
<td>AT13 Vienna</td>
</tr>
<tr>
<td>ITC4</td>
<td>Lombardia</td>
<td>ES21 Basque Community</td>
</tr>
</tbody>
</table>

Conclusion

In this paper social network analysis approach conducted both for 7th FP and H2020 Energy projects is critically analyzed by assessing precise network performance metrics for the participants of these projects to exploit their NUTS2 regions.

Based on exploratory research, the contribution offers valuable insights into four relevant aspects concerning the regional publication output of projects: number of participants, having a project coordinator whose publication presents in Web of Science, degree centrality and website status of projects. In addition, concerning the regional patent indicator, degree centrality of participants and website status of projects might seem positive relationship with this variable.

Degree centrality in network has been an important variable throughout literature, but in this research paper it is proved that having high degree centrality is not sufficient enough to have potentials for activity and knowledge.
control. Thus, the results suggest that the top performance regions with high degree centrality are the ones also have high betweenness centrality at each specific programme. Having high number of ties or being in shortest path do not cause locating in critical positions in the network. Through FP7 and H2020 top performers have not changed on a large scale, but structural holes and brokerage positions are sensitive to change. Thus, for knowledge transfer apart from big players or popular regions, it should be focused on key players on key regions.

The location of projects is deceive for investigating knowledge flow through that actor, although the projects at the center of network kept their webpages pages active. It is found that the number of scientific publications (retrieved from OpenAire) of projects was not related to the location of the project in the network at FP7 programme. Similarly, the Web of Science publication network shows markedly the publications with more co-authorship can be located both in center and periphery of the network. The findings of this study are important as they suggest that strengthening co-authorship scientific publications in relatively lagging regions could be a viable option to increase knowledge transfer, which in combination with other policies could form a base for a systematic support of regional development.

It is shown that increasing degree centrality and decreasing betweenness centrality through FP7 and H2020 on project, participant and 2-mode project participant network is an important finding which demonstrates there are more connections among network but these connections are not close each other. Thus knowledge flows through longer paths instead of shorter and dense paths. Therefore, the network structure of EU’s energy projects have been evolving into a direction supporting codified knowledge which flows through longer and weak ties.

What appears to be the key solution to the arguments undertaken in this paper is to ensure a correct allocation of funds by projects located in the structural hole and brokerage positions because existed top performers have not changed their behaviors in the network as opposed to crucial players in specific NUTS2 regions. As a result, projects designed to increase innovation focus on transferring codified knowledge on long knowledge hubs can be seen as crucial actors and potential channels for knowledge cohesion for EU’s energy programmes.

References


NGOS Institutional Case Study: A Case of Central Anatolia Region, Turkey

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Esra Ulukok  
*Kirikkale University, Turkey*

Adnan Akin  
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H. Bayram Isik  
*Professor, Kirikkale University, Turkey*

Abstract

Nowadays, Non-profit Organizations (NGOs) take increasing charges not only in social and political sphere, but also in business world. Due to such an important functions, NGOs become the subjects of both academic studies and public-private sector collaboration projects in Turkey as in the large parts of the World. In this study, it is aimed to examine the various socio-economic factors, particularly number of NGOs and their members, fields of activity, budget levels, income sources, and institutions and organizations that they receive projects in Ankara, Eskisehir and Kirikkale provinces of Central Anatolia Region, and then to make predictions about their future status.

**Keywords:** NGOs, Corporate Governance, Central Anatolia, Turkey, Financial Support, Project Income, European Union, Sustainability.

Introduction

Today, non-governmental organizations have an important role in every part of the world because public institutions have sometimes difficulties to carry out social activities in parallel with the widening of the service area and diversity offered by the states. The importance given to civil society organizations in Turkey has been increasing every day in line with the development of world. These organizations, in which they are organized in order to improve the social and economic levels of citizens, to solve social problems, to realize their goals in education, human rights and democracy, have begun to be effective in all areas of life. Non-governmental organizations are generally referred to as not for profit entities continuing their operations for the society’s social, political and cultural needs. (Karakurt Tosun, 2007: 5).

Civil society organizations perform their functions as an important stakeholder in democratization, regional and local development and economic development. Civil society organizations are seen as an effective regional and economic development tool, especially due to their ability to carry out projects at a lower cost, to be more effective in terms of mobilizing society, to contribute to poverty reduction. (Kahraman ve Tamer, 2016:175). NGOs act as an important means of employment in addition to the provision of public services such as health, education, ensuring economic development, and ensuring individual and social cohesion. While a significant portion of the population in western countries are employed in non-governmental organizations, development of NGOs in Turkey has undertaken some new functions outside of the fight against poverty after the 2000s, although not as much as in western countries. (Gündüz, Kaya, 2014:158).

European Union provides a variety of financial support to non-governmental organizations in Turkey. For example, the "Civil Society Development Program", “European Initiative for Democracy and Human Rights, “Socrates”, “ Youth ” and “Leonardo Vinci Program” programs are conducted by the European Union. (Bedük
vd. 2006: 61). TUSIAD, TUSEV, IKV and Turk-Is and DISK, as well as trade unions, are seen to be active in the EU accession process. (Tutar vd. 2012: 444).

European Union accession process paving the way for NGOs in Turkey has also strengthened their financial structure and democratization efforts along with the understanding of public-NGO cooperation. In the light of this information, this study evaluates the status of the NGOs in Ankara, Eskişehir and Kırıkkale which are located in Central Anatolian Region.

Methodology

The survey analysis conducted at the workshop with the representatives of regional NGOs constitutes the quantitative research part of this study. On the other hand, another dimension forming the basis of the study is the qualitative findings analysis of the various public entities’ data in order to determine the situation.

<table>
<thead>
<tr>
<th>Provinces/Years</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ankara</td>
<td>10.154</td>
<td>10.246</td>
<td>10.548</td>
<td>11.068</td>
</tr>
<tr>
<td>Eskişehir</td>
<td>1.206</td>
<td>1.244</td>
<td>1.284</td>
<td>1.357</td>
</tr>
<tr>
<td>Kırıkkale</td>
<td>505</td>
<td>513</td>
<td>512</td>
<td>531</td>
</tr>
<tr>
<td>Total</td>
<td>11.865</td>
<td>12.003</td>
<td>12.344</td>
<td>12.956</td>
</tr>
</tbody>
</table>

Source: Ministry of Interior, Department of Associations (www.dernekler.gov.tr)

Examining the data in Table, it is observed that the most number of NGOs for the years of 2015, 2016, 2017 and 2018 is in the province of Ankara. The number of active associations in Ankara has increased since 2015. Similarly, the number of NGOs in Eskişehir was 1.206 in 2015 and this figure reached to 1.357 in 2018. The number of NGOs in Kırıkkale province has also increased over the years. Total number of NGOs for these three provinces increased 9% in four years.

<table>
<thead>
<tr>
<th>Professional and Solidarity Associations</th>
<th>Ankara</th>
<th>Eskişehir</th>
<th>Kırıkkale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sports and Sports Associations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Associations Operating for the Realization of Religious Services</td>
<td>4173</td>
<td>1943924</td>
<td>323</td>
</tr>
<tr>
<td>Health Associations</td>
<td>1510</td>
<td>156309</td>
<td>258</td>
</tr>
<tr>
<td>Culture, Art and Tourism Associations</td>
<td>1396</td>
<td>49371</td>
<td>29</td>
</tr>
<tr>
<td>Humanitarian Aid Associations</td>
<td>484</td>
<td>137884</td>
<td>29</td>
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<tr>
<td>Education Research Associations</td>
<td>454</td>
<td>25151</td>
<td>96</td>
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<tr>
<td>Social Values Survival Associations</td>
<td>415</td>
<td>100406</td>
<td>74</td>
</tr>
<tr>
<td>International Organizations and</td>
<td>365</td>
<td>32428</td>
<td>20</td>
</tr>
<tr>
<td>Cooperation Associations</td>
<td>304</td>
<td>109285</td>
<td>22</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----</td>
<td>--------</td>
<td>----</td>
</tr>
<tr>
<td>Individual Education and Social Development Societies</td>
<td>178</td>
<td>16438</td>
<td>7</td>
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<td>Environmental Wildlife Conservation Societies</td>
<td>157</td>
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<td>Disabled Associations</td>
<td>139</td>
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<td>23</td>
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<tr>
<td>Rights and Advocacy Associations</td>
<td>132</td>
<td>23153</td>
<td>14</td>
</tr>
<tr>
<td>Associations Supporting Public Institutions and Staff</td>
<td>125</td>
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<tr>
<td>Thought Based Associations</td>
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<td>55211</td>
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<tr>
<td>Solidarity Associations with Foreign Turks</td>
<td>97</td>
<td>84186</td>
<td>13</td>
</tr>
<tr>
<td>Development, Urbanization and Development Associations</td>
<td>55</td>
<td>13407</td>
<td>6</td>
</tr>
<tr>
<td>Associations for Elderly and Children</td>
<td>50</td>
<td>6937</td>
<td>6</td>
</tr>
<tr>
<td>Martyrs Near and Gazi Associations</td>
<td>44</td>
<td>6957</td>
<td>7</td>
</tr>
<tr>
<td>Child Associations</td>
<td>28</td>
<td>2351</td>
<td>4</td>
</tr>
<tr>
<td>Professional and Solidarity Associations</td>
<td>23</td>
<td>34574</td>
<td>2</td>
</tr>
<tr>
<td>Sports and Sports Associations</td>
<td>1</td>
<td>34</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Ministry of Interior, Department of Associations (www.dernekler.gov.tr)

When Table 2 is examined; it can be seen that Professional and Solidarity Associations, Sports and Sports Associations, Associations Operating for the Realization of Religious Services, Associations operating in the field of Health and Culture, Art and Tourism Associations are active in Ankara, respectively. In Eskişehir province, the most active associations are Professional and Solidarity Associations, Associations Operating for the Realization of Religious Services, Sports and Sports Associations, Culture, Art and Tourism Associations and Humanitarian Aid Associations. When the types of associations in Kırıkkale are examined, it is seen that in
The table below shows the distribution of income sources for NGOs operating in Central Anatolia:

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>Ankara</th>
<th>Eskişehir</th>
<th>Kırıkkale</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>%0</td>
<td>52.2%</td>
<td>21.7%</td>
<td>8.7%</td>
<td>82.6%</td>
</tr>
<tr>
<td>%1-20</td>
<td>2.2%</td>
<td>4.3%</td>
<td>2.2%</td>
<td>8.7%</td>
</tr>
<tr>
<td>%21-40</td>
<td>4.3%</td>
<td></td>
<td></td>
<td>4.3%</td>
</tr>
<tr>
<td>%41-60</td>
<td>-</td>
<td>2.2%</td>
<td>-</td>
<td>2.2%</td>
</tr>
<tr>
<td>%61-80</td>
<td>-</td>
<td>2.2%</td>
<td>-</td>
<td>2.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>58.7%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

According to the data in Table 3, 82.6% of NGOs do not have any operating income. 8.7% of the NGOs provide resources from the enterprises. Another important factor that constitutes the source of income for NGOs is the

Table 3: Income Sources of Young NGOs Operating in Central Anatolia

<table>
<thead>
<tr>
<th>Source Type</th>
<th>Ankara</th>
<th>Eskişehir</th>
<th>Kırıkkale</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business Revenues</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>%0</td>
<td>52.2%</td>
<td>21.7%</td>
<td>8.7%</td>
<td>82.6%</td>
</tr>
<tr>
<td>%1-20</td>
<td>2.2%</td>
<td>4.3%</td>
<td>2.2%</td>
<td>8.7%</td>
</tr>
<tr>
<td>%21-40</td>
<td>4.3%</td>
<td></td>
<td></td>
<td>4.3%</td>
</tr>
<tr>
<td>%41-60</td>
<td>-</td>
<td>2.2%</td>
<td>-</td>
<td>2.2%</td>
</tr>
<tr>
<td>%61-80</td>
<td>-</td>
<td>2.2%</td>
<td>-</td>
<td>2.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>58.7%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Member Fees</strong></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>%0</td>
<td>43.5%</td>
<td>23.9%</td>
<td>6.5%</td>
<td>73.9%</td>
</tr>
<tr>
<td>%1-20</td>
<td>6.5%</td>
<td>4.3%</td>
<td>4.3%</td>
<td>15.2%</td>
</tr>
<tr>
<td>%21-40</td>
<td>4.3%</td>
<td>2.2%</td>
<td>-</td>
<td>6.5%</td>
</tr>
<tr>
<td>%41-60</td>
<td>2.2%</td>
<td>-</td>
<td>-</td>
<td>2.2%</td>
</tr>
<tr>
<td>%61-80</td>
<td>-</td>
<td>2.2%</td>
<td>-</td>
<td>2.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>58.7%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Project Revenues from Local Government Institutions</strong></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>%0</td>
<td>43.5%</td>
<td>23.9%</td>
<td>6.5%</td>
<td>71.7%</td>
</tr>
<tr>
<td>%1-20</td>
<td>6.5%</td>
<td>4.3%</td>
<td>6.5%</td>
<td>17.3%</td>
</tr>
<tr>
<td>%21-40</td>
<td>4.3%</td>
<td>2.2%</td>
<td>-</td>
<td>8.7%</td>
</tr>
<tr>
<td>%41-60</td>
<td>2.2%</td>
<td>-</td>
<td>-</td>
<td>2.2%</td>
</tr>
<tr>
<td>%61-80</td>
<td>-</td>
<td>2.2%</td>
<td>-</td>
<td>2.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>58.7%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Project Revenues from Non-Governmental Organizations Supporting NGOs</strong></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>%0</td>
<td>47.8%</td>
<td>26.1%</td>
<td>8.7%</td>
<td>82.6%</td>
</tr>
<tr>
<td>%1-20</td>
<td>6.5%</td>
<td>2.2%</td>
<td>2.2%</td>
<td>10.9%</td>
</tr>
<tr>
<td>%21-40</td>
<td>2.2%</td>
<td>-</td>
<td>-</td>
<td>2.2%</td>
</tr>
<tr>
<td>%41-60</td>
<td>2.2%</td>
<td>-</td>
<td>-</td>
<td>2.2%</td>
</tr>
<tr>
<td>%61-80</td>
<td>-</td>
<td>2.2%</td>
<td>-</td>
<td>2.2%</td>
</tr>
<tr>
<td>%81-100</td>
<td>-</td>
<td>2.2%</td>
<td>-</td>
<td>2.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>58.7%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Project Revenues Provided by Non-Governmental Organizations Supporting NGOs</strong></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>%0</td>
<td>54.3%</td>
<td>28.3%</td>
<td>10.9%</td>
<td>93.5%</td>
</tr>
<tr>
<td>%1-20</td>
<td>2.2%</td>
<td>2.2%</td>
<td>-</td>
<td>4.3%</td>
</tr>
<tr>
<td>%81-100</td>
<td>2.2%</td>
<td>-</td>
<td>-</td>
<td>2.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>58.7%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
membership fees. While 21.7% of the participants do not receive any income from membership fees, 26.1% of them receive fees in 1-20% range; 17.4% of them receive fees in 21-40% range; 19.6% of them receive membership fees in 41-60% range.

Looking at the amount of project revenues from central public institutions, 73.9% of NGOs do not have any income from projects provided from central public institutions. On the other hand, 71.7% of the participants did not receive project revenue from local public institutions, while 17.3% of them receive project income (1-20%) and 8.7% of them receive (21-40% project income from local public institutions.

While 17.4% of youth NGOs do not receive any income from individual donations; 17.3% of them receive donations in the % 1-20% range; 23.9% of them receive donations in % 21-40% range, 17.4% of them receive donations in 41-60% range; 19.6% of them receive donations in 61-80% range and finally 4.3% of them receive donations in 81-100% range.

87.6% of the participants do not benefit from the project revenues from national non-governmental organizations that support NGOs. A significant portion of NGOs (93.5%) do not have project income from international non-governmental organizations that support NGOs.

According to Table 4, 52.1% of the NGOs in Ankara, Eskişehir and Kırıkkale have an annual budget amount less than 100,000 TL to carry out their general activities. The ratio of those who need a budget between 101,000 and 500,000 TL is 41.3%. 6.5% of the participants in Ankara need a budget of more than 500,000 TL.

Another question addressed to NGOs is the annual budget amount they need to carry out youth activities. More than half of the NGOs stated that they need less than 50,000 TL budget; The ratio of NGOs that need 251,000-500,000 TL is only 8.7%.

### Table 4: Annual Budget Rates Needed by Youth NGOs in Central Anatolia Region

<table>
<thead>
<tr>
<th>Budget/Province</th>
<th>Amount (TL)</th>
<th>Ankara</th>
<th>Eskişehir</th>
<th>Kırıkkale</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Budget Amount Required to Carry out GENERAL Activities</td>
<td>0-50,000</td>
<td>%13.0</td>
<td>%4.3</td>
<td>%4.3</td>
<td>%21.7</td>
</tr>
<tr>
<td></td>
<td>51,000-100,000</td>
<td>%17.4</td>
<td>%8.7</td>
<td>%4.3</td>
<td>%30.4</td>
</tr>
<tr>
<td></td>
<td>101,000-250,000</td>
<td>%13.0</td>
<td>%8.7</td>
<td>%2.2</td>
<td>%23.9</td>
</tr>
<tr>
<td></td>
<td>251,000-500,000</td>
<td>%8.7</td>
<td>%8.7</td>
<td>-</td>
<td>%17.4</td>
</tr>
<tr>
<td></td>
<td>501,000-1000,000</td>
<td>%6.5</td>
<td>-</td>
<td>-</td>
<td>%6.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>%58.7</td>
<td>%30.4</td>
<td>%10.9</td>
<td>%100.0</td>
<td></td>
</tr>
<tr>
<td>Amount of Annual Budget Needed to Perform YOUTH Activities</td>
<td>0-50,000</td>
<td>%34.8</td>
<td>%10.9</td>
<td>%8.7</td>
<td>%54.3</td>
</tr>
<tr>
<td></td>
<td>51,000-100,000</td>
<td>%10.9</td>
<td>%13.0</td>
<td>%2.2</td>
<td>%26.1</td>
</tr>
<tr>
<td></td>
<td>101,000-250,000</td>
<td>%6.5</td>
<td>%4.3</td>
<td>-</td>
<td>%10.9</td>
</tr>
<tr>
<td></td>
<td>251,000-500,000</td>
<td>%6.5</td>
<td>%2.2</td>
<td>-</td>
<td>%8.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>%58.7</td>
<td>%30.4</td>
<td>%10.9</td>
<td>%100.0</td>
<td></td>
</tr>
</tbody>
</table>
Table 5: Institutions and Establishments of NGOs of Central Anatolia Region in the last 5 years

<table>
<thead>
<tr>
<th>Institutions and Organization</th>
<th>Project Accepted Status</th>
<th>Ankara</th>
<th>Eskişehir</th>
<th>Kırıkkale</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Youth and Sports</td>
<td>Yes</td>
<td>21.7%</td>
<td>6.5%</td>
<td>2.2%</td>
<td>30.4%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>37.0%</td>
<td>23.9%</td>
<td>8.7%</td>
<td>69.6%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>58.7%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>National Agency</td>
<td>Yes</td>
<td>2.2%</td>
<td>-</td>
<td>-</td>
<td>2.2%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>56.5%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>97.8%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>58.7%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Ministry of Development</td>
<td>Yes</td>
<td>2.2%</td>
<td>-</td>
<td>-</td>
<td>2.2%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>58.7%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>58.7%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>City Administration</td>
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<td>-</td>
<td>-</td>
<td>2.2%</td>
</tr>
<tr>
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<td>56.5%</td>
<td>30.4%</td>
<td>8.7%</td>
<td>95.7%</td>
</tr>
<tr>
<td>Total</td>
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<td>56.5%</td>
<td>30.4%</td>
<td>8.7%</td>
<td>95.7%</td>
</tr>
<tr>
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<td>10.9%</td>
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</tr>
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<td></td>
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<td>30.4%</td>
<td>10.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Regional Development Agency</td>
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<td>30.4%</td>
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<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>58.7%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>National Education Directorate</td>
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<td>-</td>
<td>-</td>
<td>6.5%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>52.2%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>93.5%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>58.7%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Prime Ministry Undersecretariat of Treasury Central Finance and Contracts Unit</td>
<td>Yes</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2.2%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>58.7%</td>
<td>30.4%</td>
<td>8.7%</td>
<td>97.8%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>58.7%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Ministry of Culture</td>
<td>Yes</td>
<td>8.7%</td>
<td>-</td>
<td>-</td>
<td>8.7%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>50.0%</td>
<td>30.4%</td>
<td>6.5%</td>
<td>87.0%</td>
</tr>
<tr>
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<td>58.7%</td>
<td>30.4%</td>
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<td>100.0%</td>
</tr>
<tr>
<td>Provincial Municipality</td>
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<td>-</td>
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</tr>
<tr>
<td></td>
<td>No</td>
<td>45.7%</td>
<td>28.3%</td>
<td>8.7%</td>
<td>82.6%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>58.7%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>District Municipality</td>
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<td>10.9%</td>
<td>-</td>
<td>-</td>
<td>10.9%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>47.8%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>89.1%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>58.7%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>European Union</td>
<td>Yes</td>
<td>10.9%</td>
<td>-</td>
<td>-</td>
<td>10.9%</td>
</tr>
<tr>
<td>United Nations-UNDP-CIDA</td>
<td>No</td>
<td>56.5%</td>
<td>30.4%</td>
<td>10.9%</td>
<td>97.8%</td>
</tr>
</tbody>
</table>

As presented in Table 5, the organizations received the highest project support in Ankara, Eskişehir and Kırıkkale provinces are as follows; Ministry of Youth and Sports, District Municipalities, Provincial Municipalities, European Union, Directorate of National Education, Special Provincial Administration, National Agency, Prime Ministry Undersecretariat of Treasury Central Finance and Contracts Unit United Nations-UNDP-CIDA, respectively.
Conclusion

Today, as the world's developed countries, Turkey has given support to civil society organizations and the importance is increasing every day. In the study, the structural and economic status of the associations in the Central Anatolia region, including Ankara, which is the capital of the country, has been examined.

According to the data obtained from the official sources of the country, it is determined that the Associations operating for Professional and Solidarity Associations, Sports and Sports Associations and Realization of Religious Services are the most active associations in the region. This situation may stem from the aim of providing employment for members due to high unemployment rates besides other reasons such as occupational safety, defense of workers' rights, solidarity against injustices. The association and other organizations with a high number of members are organizations that perform activities for the realization of religious services. This finding is consistent with Great et al. (2016) stated in his study that NGO participants emphasized their motivation to create religious value and social benefit.

78.3% of the non-governmental organizations in the region receive their income from membership fees. 73.9% of NGOs do not have any income from the projects provided by central public institutions. 82.6% of youth NGOs receive income from individual donations. 82.6% of the participants do not receive any project income from national non-governmental organizations supporting NGOs; 93.5% of participants do not have project income from international non-governmental organizations that support NGOs. According to these results, it is seen that most of the NGOs in the region survive with donations and membership fees. Dogan et al. (2018) revealed in their research, that civil society organizations operating in the Mediterranean region of Turkey have some difficulties in obtaining income in a similar way in general.

In the last 5 years, the institutions and organizations with the highest number of projects in the region are the Ministry of Youth and Sports, District Municipalities, Provincial Municipalities, European Union and National Education Directorate respectively. As it can be seen, although the regional NGOs cannot be fully rescued from the locality, the amount of projects they receive from the European Union is pleasing. However, in general, it is determined that the rates of execution of the projects from various institutions are very low. One of the biggest problems of NGOs in the region is the lack of resources to carry out its activities.

In general, with membership dues and limited individual donations is not possible to survive and reach the expected activity along with sustainability and good corporate governance. While the importance of NGOs together with Turkey's European Union membership process has been evolved over the years, the contributions of the EU's financial support and funds to the economic development of the region and democratization of the regional status have been considered to be very important, but it has been determined that they do not sufficiently benefit from these opportunities. The cooperation of various public institutions, especially the Ministry of Youth and Sports, in recent years, as well as cooperation meetings and information meetings with NGOs are reflected as important initiatives. Providing support to public institutions, providing support for international projects, and providing expert support for project execution will help them to strengthen their roles in democracy, education, human rights, economic development, politics, politics and social welfare.

References


The Effect of Psychological Contract Opposition on Organizational Dissent

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Abstract

Violation of the psychological contract, which is a concept that has significantly influenced employment relations in recent years, can lead to significant individual and organizational consequences. One of the important outcomes of the violation of the psychological contract is the organizational opposition behavior. The main purpose of this study is to determine the effect of psychological contractual violations of teachers working in high schools in Kirikkale province on organizational opposition. According to the results, it was determined that the violation of psychological contract affected only the vertical opposition dimension of the organizational opposition and there was no significant effect on the displaced opposition and the horizontal opposition.

Keywords: Psychological Contract Breach, Organizational Dissent, Work Behavior, Corporate Governance

Introduction

Continuous changes and technological advances on a global scale over the last 20 years have not only affected social life and political attitudes, but also enterprises. Although the limits of the obligations between the employee and the employer are determined by legal employment contracts, there are employee and employer expectations that do not reflect the legal agreements. Psychological contract is a non-written dynamic contract which is formed according to the employee's perception of mutual expectations and obligations in the relationship between the employee and the employee. Psychological agreement is defined as individual beliefs that include mutual obligations between the worker and the employer. (Rousseau, Tijorivala, 1998). Violation of the psychological agreement is defined as the parties failed to fulfill their obligations under the psychological contract they have expressed as failure. Morrison and Robinson (1997: 230). According to Robinson and Rousseau (1994: 247), for example, in case of wage increase in return of overtime, as promised, it will be considered by the management to be fooled if this promise is not fulfilled. Such a situation will lead to the formation and dissemination of injustice perception within the organization. The perception of a violation of the contract between the parties will reveal many negative organizational and individual attitudes and behaviors.

Robinson and Rousseau (1994) stated that the violation of psychological contract decreases job satisfaction but increases the intention to quit. Turnley and Feldman (1999) found a positive relationship between employees' soundness and perception of violation; Guest and Conway (2002) found that the perception of a breach of contract was lower in the enterprises where the communication was carried out effectively. In line with these findings, it is important to reveal the relationship between the perception of violation of psychological contract and the dissident behavior of employees.
The opposition, which is a dimension of employee voice, which includes the opinions of the employee about his / her disagreement or conflicting issues with the institution, may occur if individuals face psychological and political restrictions. (Kassing, 1998:184).

Kassing (1997) argued that three types of opposition were effective in organizations. These; vertical opposition, which expresses the fact that the individual expresses his dissenting opinions clearly to the administration (articulated dissent); horizontal opposition containing statements for group of colleagues, colleagues (latent dissent) and the displaced opposition, which includes an individual’s criticism of the organization, such as friends, family and spouses. (displaced dissent).

Goodboy et al. (2008) found that distributional justice and interpersonal justice were negatively related to horizontal opposition (latent dissent) and informational justice was positively related. Hence, the sense of injustice was seen as an important trigger of dissenting behavior. Research on violations of organizational opposition and psychological contract provides important clues about the relationship between the employee and the employer and the organizational climate. The most important points emphasized by the researches on these issues are the robustness of organizational communication and the spread of the perception of justice among all employees.

Methodology

The main purpose of this study is to determine the relationship between these two variables by revealing the perceptions of violation of psychological contract and the level of organizational opposition. The sample of the study consisted of 111 teachers working in state and private high school schools located in the center of Kırıkkale. Easy sampling method was utilized in the survey. Table 1 presents the demographic information of the participants.

Scales: In this research, personal information form, violation of psychological contract and organizational opposition scales were analyzed.

Psychological Contract Violation Scale
In turkish version of the study, which was developed by Robinson and Rousseau (1994) a nine-item scale was used by Çetinkaya and Özkara (2015). The scale consists of a single dimension. The scale items were graded with 5-point Likert as totally disagree = 1 point and absolutely agree = 5 points. The high scores indicate the excess of the violation of the psychological contract and the low scores indicate low level of the violation.

Organizational Opposition Scale
In order to measure the employees' organizational opposition behavior, Organizational Opposition Scale consisting of 3 dimensions, vertical opposition, horizontal opposition and displaced opposition developed by Kassing (2000) was utilized.

Hypotheses
The hypotheses created within the scope of the research are as follows:
H1: Perceived perceptions of psychological agreement of participants affected vertical opposition dimension of organizational opposition
H2: Perceptions of respondents to psychological contract affect the horizontal opposition dimension of the organizational opposition
H3: Perceived perceptions of psychological contractual violations of the participants affected the displaced opposition dimension of the organizational opposition
Results

Table 1: Demographic Characteristics of Participants

<table>
<thead>
<tr>
<th>Sex</th>
<th>N</th>
<th>%</th>
<th>Experience</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>53</td>
<td>47.7</td>
<td>Less than 1 year</td>
<td>1</td>
<td>0,9</td>
</tr>
<tr>
<td>Male</td>
<td>58</td>
<td>52.3</td>
<td>1-5 years</td>
<td>24</td>
<td>21.6</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td>6-10 years</td>
<td>53</td>
<td>47.7</td>
</tr>
<tr>
<td>Single</td>
<td>17</td>
<td>15.3</td>
<td>11-15 years</td>
<td>28</td>
<td>25.2</td>
</tr>
<tr>
<td>Married</td>
<td>94</td>
<td>84.7</td>
<td>16-20 years</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>Widow(er)</td>
<td>0</td>
<td>.0</td>
<td>21 and above</td>
<td>3</td>
<td>2.7</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td>School Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uder 25</td>
<td></td>
<td></td>
<td>Public</td>
<td>81</td>
<td>73</td>
</tr>
<tr>
<td>26-34</td>
<td>22</td>
<td>19.8</td>
<td>Private</td>
<td>30</td>
<td>27</td>
</tr>
<tr>
<td>35-44</td>
<td>66</td>
<td>59.5</td>
<td>University</td>
<td>109</td>
<td>98.2</td>
</tr>
<tr>
<td>45-54</td>
<td>22</td>
<td>19.8</td>
<td>Graduate</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>Above 55</td>
<td>1</td>
<td>0.9</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Of the teachers participating in the study, 47.7% were women and 52.3% were men. It is seen that more than half of the participants have an age of 35-44. In terms of service time, 21.6% of the participants are between 1-5 years; of 47.7% are between 6-10 years; of 25.2% are between 11-15 years; It has a working time of 1.8% for 16-20 years and last for 2.7% for more than 21 years. 73% of the participants work in public high schools and 27% in private schools.

Table 2: Relationship Between Violation of Psychological Convention and Organizational Opposition

<table>
<thead>
<tr>
<th></th>
<th>Average</th>
<th>Vertical Opposition</th>
<th>Horizontal Opposition</th>
<th>Relocated Opposition</th>
<th>Violation of Psychological Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical Opposition</td>
<td>2,86</td>
<td>1</td>
<td>.122</td>
<td>-182</td>
<td>.387**</td>
</tr>
<tr>
<td>Horizontal Opposition</td>
<td>3,08</td>
<td>.122</td>
<td>1</td>
<td>.433**</td>
<td>.115</td>
</tr>
<tr>
<td>Relocated Opposition</td>
<td>3,13</td>
<td>-.182</td>
<td>.433**</td>
<td>1</td>
<td>-.035</td>
</tr>
<tr>
<td>Violation of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychological</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contract</td>
<td>2.42</td>
<td>.387**</td>
<td>.115</td>
<td>-.035</td>
<td>1</td>
</tr>
</tbody>
</table>

When the information in Table 2 is examined, it is determined that there is a positive relationship between the vertical opposition behavior and psychological contract violation levels of the teachers (r = 387). According to these results, only the relationship between the vertical opposition dimension and the perception of violation of
psychological contract was determined from the sub-dimensions of the organizational opposition and no relation was found between horizontal and displaced opposition behavior.

Table 3: Influence of Psychological Contract Violation on Vertical Opposition

<table>
<thead>
<tr>
<th>Violation of Psychological Contract</th>
<th>B</th>
<th>β</th>
<th>t</th>
<th>R²</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.203</td>
<td>0.387</td>
<td>4.381</td>
<td>0.150</td>
<td>19.192</td>
<td>0.00</td>
</tr>
</tbody>
</table>

When the regression analysis table which testing the effect of violation of psychological contract on vertical opposition is examined; it is seen that the violation of psychological contract is a significant predictor of vertical opposition. According to this, it was found that the perception of violation explained 15% of the vertical opposition and the model was meaningful at 1%. (R² = 0.150 p < 0.01).

Conclusion and Discussion

Today, besides legal concept of employment conceptual psychological contract is another factor that affects employment relations and changes its structure. Psychological conventions which express the expectation of the employees from the employer and do not have a written basis including the beliefs of individuals about mutual expectations and obligations, cause various individual and organizational attitudes and behaviors in the employees when they are not fulfilled by the management. In addition to affecting attitudes and behaviors such as employee performance, job satisfaction, organizational commitment, violations of psychological contract in this research were considered as a precursor of organizational opposition. As a matter of fact, employees who perceive that their obligations are not fulfilled from their managers within the scope of the psychological contract are expected to exhibit opposition behaviors against the management and business policies. As stated in the results of the regression analysis, the violation of psychological contract has emerged as an important determinant of organizational opposition behavior.

According to the results in Table 3, the violation of the psychological contract positively affects the vertical opposition sub-dimension of the organizational opposition. However, it was concluded that the perception of violation had no effect on the horizontal and displaced opposition. For this reason, only hypothesis supported among proposed hypotheses is the hypothesis I. It is concluded that there is no significant relationship between disproportionate opposition behavior and the violation of psychological contracting, which expressed the views of horizontal opposition behavior and non-organizational individuals (family, friends, etc.) expressing their dissenting opinions to other members of the organization.

Dağlı and Ağalday (2015), in a study conducted by teachers, revealed that the highest-level executive behavior that caused the teachers to oppose to the administration is the decision making of the school administration without consulting teachers on issues of interest to teachers. As a matter of fact, the expectations of the participants on the decisions of the psychological contract are also included in the expectations. Therefore, employees who think that there is a breach of contract exhibit vertical opposition behavior by expressing their dissenting opinions directly or openly to the management. According to another data obtained, teachers' organizational opposition behavior is moderate and violent perceptions are low. The fact that the participants' perceptions of violations of psychological contract is lower than expected is promising for both the school administration and the teachers.

As a result of the findings obtained from the research, it can guide the decision-makers in the education sector to reduce the perception of psychological contract violations and thus to organize the methods, workflow and charts in which the employees can perform their expectations from the management. With good corporate governance principles, accountability and transparency in decision making process will likely to improve organizational resiliency and durability. Failure to enforce the policies imposed compulsory on other institutions and organizations, especially educational institutions, the management’s moderate approach to the employees'
dissenting behaviors, reorganization of the practices and methods that cause dissident behavior and ensure of teachers’ participation in decision making processes will be an important steps.

This research covers only teachers working in educational institutions operating in Kırıkkale province. In future studies, conducting the studies to be carried out in other sectors and incorporating other variables that cause organizational opposition into the research model will likely to provide more comprehensive and meaningful results.

References


Managing Critical Tasks Within Ambidextrous Organizations

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Abstract

In this paper dual business decision making process and complexity of contextual ambidexterity is analyzed. The appropriate level of ambidexterity, as well as the complementary effect of both exploratory and exploitative activities is set as a framework for integrating critical business tasks within every unit of a company. Delegation of authority and freedom to think outside of a box is especially significant from a frontline manager stand point. The main focus is on how management of critical tasks between senior executives and lower-level managers could affect business performance and efficiency. Multimodality of configurational exposure of product and market functions is seen as important in promoting mix of informal interplay and formality of an organizational architecture. Overview of relevant results for paradoxical strategic intent shows us how it can reshape managers’ attitude towards risk and crucial business challenges. Absorptive capacity enhances monitoring of information exchange, controls and coordinates business units cost reduction, making a positive relationship between product-driven portfolio and business performance. The paper emphasizes the importance of transformational leadership and simultaneous management of critical tasks of exploitation and exploration, rather than just a static ambidexterity.

Keywords: Ambidexterity, Exploitation and Exploration, Critical Tasks, Delegation of Authority

JEL classification: M1, D7, D83, F23

In the dynamic, disruptive business environment of the new innovation economy, evolvement mechanisms based on the company’s capability to fit its strategy with present organizational architecture are essential. With the consideration of business uncertainty, threats and weaknesses of organizational climate, shorter product’s life cycles push systems into the dilemma of the self-determination process of individual member’s behavior. Management practices are showing the necessity of context-specific research how to integrate effective solutions into unique business structure, but still to keep unit’s semi-autonomous decision-making process. Temporal shifts within business semi structures to oscillate between exploitation and exploration drive flexible changes of organizational adaptation. Sequential ambidexterity can be very disruptive and hard to coordinate on the business unit level, especially from a tasks standardization point of view. Perhaps even more difficult would be to address how and to which extent organizational ambidexterity affect critical tasks performance and avoidance of duplicative and inefficient management. Hence, this paper will research ambidexterity from business unit perspective and cross-communication effectiveness.

Considering that overall results linking ambidexterity to efficiency have inconsistency, possibility of a U-shaped relationship between ambidexterity and business unit’s performance is observed. According to research, under low task autonomy, age do have a inverted U-shape effect on performance (van der Borgh and Schepers, 2014). If sales decisions are made in line strictly with senior management control, age will affect performance due to declines in agility of critical tasks executor, depending on the specificity of the task itself. Customer perception of poor business unit strategy is a threat for companies, in case there are obstacles in coordinating the operation planning of the unit, with micromanaging tendencies of individuals. Quite often multinational companies are facing a problem of poor upstream communication in cases when area industrial division managers’ finger point and blame other divisions for not following their production strategy. Standing point of view diversity should be respected when various methods are leveraged and independent commercialization strategies are developed.
Structural and contextual ambidexterity is emphasizing skill-based and job-based training, with high intensity of job rotation. The discussions between technical and product expert teams should be formalized into one broad group to identify local targets. Project groups at the local level should have tight cooperation, close interactions with the aim to serve both exploratory and exploitative learning processes. Error-avoiding and error-embracing control systems are focused on broadening managerial competencies and enhancing functional skills, whereas internal mobility of work disciplines could be monitored for specific projects. Some authors (D’Souza, Sigydal and Struckell, 2017) digress to the appropriate level of relative ambidexterity and offer a versatile framework to help practitioners to explore the balance of exploration and exploitation capabilities. This paper represents a progression to this, referring how the referent group should exploit this conceptualization and deploy strategy of relative organizational ambidexterity with flexible senior management approach.

### Applying Critical Tasks of Exploration and Exploitation in Dynamic Contexts

The nature of ambidextrous relativity and its confluence of synergies can often mislead to imprecise scale-based measures and complex coordination of critical tasks deployment on a strategic level. Following the senior managers’ guidance, incentive system will motivate two different divisions to work together, even though they are competing for same marginal improvements. However, some authors (O’Reilly and Tushman, 2004) argue that exploit and explore divisions must operate with the completely different strategic approach, structure and separate management of critical tasks. Exploration will enhance incremental innovation for production and, allegedly, always find a best way to incorporate, i.e. fit adaptive structure within the company’s organization. Nevertheless, it is clear that ambidexterity will fail in strategy implementation if delegation of crucial responsibilities is not done by neutralizing threats of cross-division tensions and finger-pointing mechanism. That is why special focus is on the configurational exposure of frontline managers and their correlation with senior executives. With views of collectively managing risk, bottom-up evolving communication helps integrate inter-organizational activities.

Competency trap can occur as a managerial challenge of mental balancing arises between present, dynamic capabilities and potentials of disrupted innovations. Having in mind the significance of paradoxical thinking for these alternative strategies, the concept of “contextual ambidexterity” is adequate for defining capacity of both ambidextrous alignment and adaptability across an entire business unit (Gibson and Birkinshaw, 2004). Accordingly, this approach focuses more on the paradoxical managerial concept, rather than to an elimination tactic, given the fact it encourages individuals to divide on their own alignment and adaptability-oriented tasks.

Senior management can still put in place those systems and thereby reshape frontline manager’s attitude towards risky behavior (Burgelman, 1983). Conversely, in dynamic, market-oriented business units it is noticeable that senior executives intervene more, while recognizing innovative ideas and enhancing the strategic coherence of the unit (Gibson and Birkinshaw, 2004). Hereby they rather serve as a role model for behavior and paradoxical thinking of others, and less by strictly creating business processes on their own. Supportive environment for upstream communication and delivery business units creates a balance between a pair of hard elements (discipline and stretch) and a pair of soft elements (support and trust) (Gibson and Birkinshaw, 2004). Hence, we would like to show how does this enhance both exploit- and exploration-oriented actions, that is how could they be well managed together and standardized on a business unit level. Personal commitment to objectives should initiate cost reduction, although it is challenging to distinguish what type of actions prevails, affecting compensation scheme in a long run. Loose-tight model of self-interests enlightenment does align well with the company’s objectives, simultaneously focusing on stretch and trust within the participation management.

Supportive activities will have sustainable shape, as long as senior executives create contextual ambidexterity on an organizational level. Primarily fostering adaptability of business solutions can create competitive advantage and keep multiple paths strategy effective. Multilevel approach is significant, as it is warned that interconnected tensions might occur, reflecting both strategies (Dougherty and Hardy, 1996). Therefore, configurational matching of cultural focus with organizational design is vital for product-side objective, and how to integrate it with distinct market targets, as shown in figure 1.
Exploitative strategy will commercialize knowledge and creative ideas, but with the lack of exploration firm will not be able to position its product in varying project iterations and simply will vanish after a certain time (Andriopoulos and Lewis, 2009). Formal systems and processes are being swapped with the creation of a particular type of individual creative “stretch”, whereas values are initiating new ideas within individuals, not by leaders putting higher effort to monitor their beliefs. Frontline managers should be willing to take prudent risks, to exhibit certain attributes of understanding how to holistically approach to base decision making. Like Hedlund and Ridderstrahle (1997) pointed out, contemporary company needs “Renaissance company men” who will simultaneously focus on creative thinking, while exploring new innovative business tendencies to facilitate. Coexistence of non-specialized, simultaneous discipline and democracy should integrate “one-size-fits-all” strategy, with special dedication of top management team. Since the crucial task is to distinguish how to adapt the organizational change, clear process management should pursue incremental change, involving frontline managers and objectively assessing their understanding of the process itself.

The main dilemma is whether employees are capable of undertaking the actions connected to exploration and exploitation, because no matter how good the strategy is, the executive team will not be able to sustain it without continuous improvement of the entire team. Lack of ideas, time and listening can decrease productivity, whereas proactive strategy of identifying individual, organizational capabilities should be included in the first phase of strategic planning (Iyer, 2009). Subsequent ability to adapt in changing environment will most likely depend upon social capital, rather than just on human capital. If the organizational architecture is internally inconsistent, senior management team cannot integrate structural targets within distinct business units. That is why structural ambidexterity is significant in an early product’s evolution (Benner and Tushman, 2015). Paradox strategic intent of ambidexterity is characterized by high risk and intense dynamic, emphasizing both breakthrough inventions and profitable goals. These dual emphases show pragmatic idealism, as Collins and Porras (1994, p. 44) highlighted. Linking right idea with the right time needs creative thinking when faced with restrictions key clients set. As such, the dual strategic framework of exploration and exploitation for one single unit proves to be effective, where senior management would control critical tasks involved. Structural simultaneous integration from a frontline manager point of view is often seen as pure uninfluential, reactive implementation of tactical roles, monitored by a top management team (Gibson and Birkinshaw, 2004), but empirical findings showed that this is not completely accurate on a business level.
Lower-level managers should take part in actively shaping organizational design, experimenting and enhancing absorptive capacity of the company. Contextual ambidexterity urges for frontline managers also to change, to adapt and engage in bottom-up experimentation (Floyd and Lane, 2000). The goal and supervision autonomy require alignment of activities of research and development team with customer needs. Special tensions can emerge when senior management is ensuring fulfillment of existing customer interests. Although this is efficient from a market side, it is still found that promoting support of informal organization to formal structure can lead to important interplay of frontline managers (Zimmermann, Raisch and Cardinal, 2013). This autonomy will promote market exploration, as well as engaging internally market oriented initiatives. If complementary product and market explorations are not reached by frontline managers, studies (Zimmermann, Raisch and Cardinal, 2013) show that it can be quite harmful for the organization. Additionally, it should be ensured that both sides have an adequate source of knowledge and information they need. Training programs, brainpool sessions are especially important for coordination processes of exploitation, noting that lack of experience and lack of expertise often happens.

Having in mind that exploration can have implications for exploitation in other functional unit, continuous cycles of contextualization and tension nesting is required. As the cycle continues, interactions are positioning the firm to meet desired goals and leverage multilevel opportunities. Dynamic equilibrium (Smith and Lewis, 2011) of constantly pushing the organization out of stable convergence is relevant, allowing it to combine a need to differentiate between exploration and exploitation, integrating these activities across frontline critical tasks. Some authors (Jansen and Cao, 2012) elaborated that interplay between exploitation and exploration can lead to absorptive capacity. Moreover, the size of a company and its organizational capacity need to be considered to enable a thorough investigation of absorptive capacity. Of course, poor performance management can leave risk taking tasks imprecisely defined and unmatched for exploration integration. Research indicates that management itself is paradoxical and that this intent can eliminate cognitive strain in a long run (Keller and Weibler, 2015). Complementary tactics and synergy will give wind to new cycles of ambidexterity, where paradoxical mindset is essential for underlying processes of change. Likewise, this paper stresses the importance of paradoxical, self-driven way of thinking, encouragement of frontline managers to react semi-autonomous to innovative opportunities of tomorrow. As a main challenge for cultivating a paradoxical vision, leverage of skills and delegation of the critical tasks is underlined. To iterate between constraints and freedom, first and foremost, the level of preparedness of frontline managers to execute tasks needs to be examined. Project-driven integration needs to be seen through a time framework of conceptualizing models of collaboration. Due to this, in this paper we point out some of most significant research papers that emphasize in which manner crucial tasks of the ambidextrous organization are managed, with aspects to business performance and efficiency. As shown in table 1, an overview of relevant empirical findings related to ambidexterity and its impact on performance are collected. With addition to this, we examine its contribution from a managing tasks point of view.
## Table 1. An overview of relevant studies for managing crucial tasks for ambidexterity and their contribution

<table>
<thead>
<tr>
<th>Author</th>
<th>Scope of research/Field of interest</th>
<th>Ambidexterity/ Effect on performance/ Moderation</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Koryak and Others (2018)</td>
<td>Empirical/Attention based view of the firm/SMEs</td>
<td>Yes/No/SMEs</td>
<td>Exploration and exploitation have a paradoxical relationship; focus is on antecedents of the components of ambidexterity: top management team, firm’s innovation capabilities and continuous improvement capabilities. Vision has important impact on exploitation skills, but not on exploration. Empirical data should encourage SMEs managers to integrate factors for organizational ambidexterity.</td>
</tr>
<tr>
<td>Sharma, Nguyen and Crick (2018)</td>
<td>Marketing Capability/Alignment of strategies/Asymmetric relationship</td>
<td>Yes/Yes/Contract Manufacturing Exporters</td>
<td>The serial mediation effects suggest that exploitation strategy leads to practices of exploration, which navigates company investments towards developing a marketing capability. Asymmetric relationship of exploration and exploitation is beneficial for small, weak firms who seek to gain new value for existing products/services.</td>
</tr>
<tr>
<td>Bauer and Others (2018)</td>
<td>Pre- and post-merger exploration and exploitation</td>
<td>Yes/Yes/Mergers. Firm size</td>
<td>Strategic fit is more complicated than it looks; integrating both strategies is more demanding for SMEs; acquisition can lead to inappropriate generalizations in cross-domain relationships.</td>
</tr>
<tr>
<td>Limaj and Bernroider (2017)</td>
<td>Empirical/ Explorative and Exploitative innovation</td>
<td>Yes/Yes/Cultural measurement</td>
<td>Cultural balance moderates the relationship between organization’s exploratory and exploitative innovations, completely mediated by absorptive capacity.</td>
</tr>
<tr>
<td>Lin and Others (2017)</td>
<td>Inter-organization/Social capital/High-tech parks</td>
<td>Yes/Yes/Social capital</td>
<td>Greater amount of organizational capital relative to human capital has a positive influence on innovative exploitative activities; greater ration of organizational to human capital has negative correlation with exploratory strategy. Combining organizational,</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Methodological Framework</td>
<td>Outcomes</td>
<td>Findings</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------------------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>Keller and Weibler (2015)</td>
<td>Empirical/Balancing performance/Costs/Cognitive strain</td>
<td>Yes/Yes/No</td>
<td>Transformational leadership is appropriate concept for stimulating ambidexterity. Due to cognitive strain, ambidextrous organization requires compensations. Empirically suggesting positive relationship between ambidexterity and cognitive strain.</td>
</tr>
<tr>
<td>Kauppila (2015)</td>
<td>Firm growth/ Financial performance</td>
<td>Yes/Yes/ Inter organizational</td>
<td>Inter-organizational performance is reduced by constantly implementing both exploration and exploitation, where exploitation improves financial performance, while exploration firm’s growth rate.</td>
</tr>
<tr>
<td>Stettner and Lavie (2014)</td>
<td>Inter-organizational/Market Value</td>
<td>Yes/Yes/No</td>
<td>Balance within modes (alliances, acquisitions) is less beneficial than balance across modes. Hence, acquiring firm with a certain level of knowledge, while identifying established knowledge for exploitation of the product strategy is quite beneficial. Absorptive capacity enhances exploration tendencies.</td>
</tr>
<tr>
<td>Voss and Voss (2013)</td>
<td>Organizational/Ticket Revenue</td>
<td>Yes/Yes/No</td>
<td>Complementary effect of distinguished strategies on exploration and exploitation for SMEs. Market ambidexterity has foremost a positive effect for large size firms with successful history. Cross-functional market exploration and operational exploitation has a positive effect on performance.</td>
</tr>
<tr>
<td>Jansen, Simsek and Cao (2012)</td>
<td>Organizational/Financial/Business unit performance</td>
<td>Yes/Yes/No/ Centralization</td>
<td>Business unit ambidexterity has a positive impact on performance of a company, with special focus to less centralizing resources and capabilities.</td>
</tr>
<tr>
<td>Boumgarden, Nickerson and Zenger (2012)</td>
<td>Case studies/ Organizational/Market share/Revenue growth</td>
<td>Yes/Yes/No</td>
<td>Comparative analysis between switching specialization of exploration and exploitation by individuals over time and in correspondence to market needs (vacillation), with “static” ambidexterity approach. Vacillation</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Methodology/Context</td>
<td>Success/Failure</td>
<td>Comparison</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------------------------------------</td>
<td>-----------------</td>
<td>------------</td>
</tr>
<tr>
<td>Fernhaber and Patel (2012)</td>
<td>Multi-performance measure of growth/sales/employees</td>
<td>No/No/No/Absorptive capacity</td>
<td>Both absorptive capacity and ambidexterity positively moderate the inverted U-shaped relationship between product portfolio complexity and business performance, whereas absorptive capacity enhances control, monitoring of information exchange, coordinates business units cost reduction and also outlines strategic opportunities of a firm.</td>
</tr>
<tr>
<td>Ferrary (2011)</td>
<td>Case studies/Inter-organization</td>
<td>Yes/Yes/No</td>
<td>Comparison between two companies that specializes either on exploration or exploitation. When an exploration is obtained through acquisition and development strategy, enhanced exploitation outperforms ambidexterity for absorptive capacity of a company.</td>
</tr>
<tr>
<td>Kauppila (2010)</td>
<td>Case studies/Inter-organization/Profit</td>
<td>Yes/No/No</td>
<td>Inter-organization framework defined through combining externally and internally learning capacity of company’s ambidexterity. Absorptive capacity is most relevant for internal ambidexterity.</td>
</tr>
<tr>
<td>Gupta and Others (2006)</td>
<td>Inter-organization/Long-run performance</td>
<td>Yes/Yes/Yes</td>
<td>Comparison between simultaneously managing critical tasks of exploitation and exploration, versus precise equilibrium of specialization, depending upon business conditions.</td>
</tr>
<tr>
<td>He and Wong (2004)</td>
<td>Organizational/Sales growth rate</td>
<td>Yes/Yes/No</td>
<td>Emphasizing one pursuit of exploitation or exploration, i.e. specializing for just one value creation is negatively related to sales growth. On other hand, ambidexterity is positively related to sales growth rate.</td>
</tr>
</tbody>
</table>
Discussion and Conclusion

In this paper, we examined how managing crucial tasks can be semi-autonomous within the ambidextrous organization and how frontline managers can tackle more freely exploitative and explorative challenges that are ahead of them. Considering relevant empirical findings, alongside with various examples of activities, processes and competences set of specific strategic pursuit for ambidexterity is proposed. We have been able to identify relevant approaches to product-driven and market-driven abilities of a company. We have taken into account cognitive perspective of senior executives, alongside with aspirations of lower-level managers. Special focus is on inter-organizational know-how transfer and limits to implement a bottom-up strategy on a business unit level. Theoretical proposition described the logic behind fostering both radical and incremental innovation. Configuration complexity implies a high intensity of the antecedents of exploitation and exploration. Organizational architecture of a contemporary, leading company is more likely to adopt simultaneous structural ambidexterity over singular specialization, but that surely varies from a specific case study.

An overview of relevant results indicates that research leads us to highly varied assumptions, making it is still unclear how will the configurational exposure change organization over time. Most of the limitations come from the fact that exploration is quite often associated with both radical and incremental innovations, making it difficult to assess ambidextrous causal map. The results provide an interesting frame for further discussion about company’s learning capacities, complementary effect of distinguished strategies on business performance, moderation of absorptive capacity and ambidexterity, alongside with other contributions to managing critical tasks. View on how should companies exploit or explore has still some limitations based on cognitive analysis, although the theory of knowledge is making continuous improvements to resolve them. It is also concluded that cognitive maps should be used more as a methodological alternative, as analysis has been shown (Danneels, 2002). The impact of the ambidextrous behavior of senior and frontline managers on execution of crucial tasks remains open for studies and clarification, based on a question whether it is a solution that can completely resolve multidimensional challenge of the tensions, balances and equilibrium leaders must manage in a complex business environment.

References


The Future of Money Markets in the Unipolar World:
Neo-Bipolar Order in Context of the Dollarization-Yuanization Equilibrium

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Abstract

The concept of dollarization is not a technical term for monetary theory or monetary policy in this study; it is handled as an international political economy tool. In other words, not considered as a currency substitution, it is remarked as foreign trade policy and a hegemonic concept in international markets. Moving from the agricultural community to the industrial society, the US, which brought production and exports to enormous levels and became the center of capitalism of the 20th century, imposed US Dollar on other countries as a means of Exchange in international markets through the Washington Accord (or the Washington Consensus). The justifications such as “crisis-contraction-recession”, which are used in the terminological sense of the dollarization, have been put forward for the first time in this agreement, by the IMF and World Bank, have carried out indexing of underdeveloped countries to USD. Particularly, in 1990s, the other contries of the world, which frequently experienced regional crisis, considered dollarization as a prescription for salvation. In last decades, the PRC, which reached up rapid growth rates, wants to be used RMB in its regional trade areas. Onto this issue, the PRC has made progress recently. It is still controversial that, if it is possible or not to return the bipolar world.

Keywords: Unipolar monetary order, global trade, dolarization, FED, PBoC.
JEL Classification: E42, E52, E58, F02.

Introduction

In order to stabilize the prices of goods and services in real terms, the people of all countries, who use the money as a means of Exchange; in other words, in order not to lose purchasing power, instead of domestic money; gold, foreign Exchange, commodity exchanges, stocks, bonds, etc. they turned to other savings instruments other than money. Among them, the USD occupied an important area, the demand for dollars increased and the value of domestic currencies fell, the markets were dollarized. In particular in the 20th century, payments were realized in USD, because many countries imported production inputs and final technological products from the USA. Over time, in some countries, the USD undertook the task of exchange as a full substitution, while in many other countries it was used indirectly or informally.

FED was another pillar of the dollarization policy. Unlike the governmental structure in other contries, with the capital of the leading banks of the country, which was established in the early 20th century, FED attracted attention and reactions due to its quite different functioning. However, it has continued its activities as it has a legal basis. The Federal Reserve, which has dollarized international markets and has become an important institution in this regard, opposes the demands of the Federal Government, provides another valuable paper in exchange for valuable paper, namely, the banknote on behalf of the government. In fact, the standart monetary base expansion policies are not very different from this method, the market is constantly monetizing dollars.
Today, for example, India, which buys natural gas from Turkmenistan, does not pay its debt by Rupee or Manat. The deals are entirely on the US dollar. As seen from the example, even those who do not have any commercial or financial relations with the US, are indebted and paid in dollars. The fact that international online money transfer systems are of US origin is also a major factor.

The market hegemony, which the US created by dollars, disturbed the developing economies for a long time. Although Russia and China have sometimes expressed their disturbance with different diplomacies, the prevailing currency still continues as dollar. However, thanks to the reforms of 1978, the country has become the second largest economy in the world in the final analysis, achieving the rapid growth rates in the literature as "China Miracle". China, which is growing export based, aims to use Yuan as an alternative tool for international payments and has taken initiatives for this. In this case, "In the international markets, is the Yuan coming next to the dollar?" brings to mind the question.

In the International Markets, Moving towards the Contraction of US Dollar

Dollarizing the markets is relevant the increase of foreign trade volume around the World, economic growth average of the World and mostly the US dominance on the markets. The USA, largest economy in the World since 1871 (Investopedia, 2018).

Figure 1: Growth rates of the US and World Average between 2004-2016 (WORLDBANK, 2018a).

In the figure 1 above, the average growth rate across the world points to another dimension of dollarization, with almost the same course of US growth. The import of production inputs and the export both intermediate and final goods to international markets of the USA; it brings the two indicators closer together. If production and foreign trade are accepted as the starting point of dollarization; FED realizes the final. USD, which feeds the world fund market, is depreciating or gaining value by FED's decisions on interest rate cut or increase. When the interest rates decrease, USD purchases are realized in international markets and sales increase when interest rates increase. Buying and selling also determine the price of USD in countries with free exchange rate regime.

The PBoC's Domestic Stabilization and Fighting Foreign Threat Policies

The monetary policies of the United States, which were built on the post-war unipolar order, are no longer disturbing China, which has made a leap in production and exports after reforms. Especially after the Bank of China has been established, the PBoC, which has been redesigned to keep up with the world markets, presents different policies with the control of Renminbi and its control in the market. However, it does not only regulate
financial markets but also financial markets, rather than money markets, and even implements decisions taken by the state council (PBC, 2018).

Although the People’s Bank of China does not have autonomy, it does successful work to protect the country's monetary value. For example, with the sum of more than $3 trillion savings in the reserve (SAFE, 2018), it can intervene in the foreign exchange markets either directly or indirectly. Therefore, it does not feel the need to use interest rates.

Klingelhöfer and Sun (2018, 39-40), who confirmed that the PRC had no linear monetary policy and followed a policy of, struggle in accordance with the instructions from the central government, reached the conclusion that PBC has focused more on fighting inflation and supporting growth. In fact, Zhang (2009, 483-484) criticizes the central government's policy of liberalization, as well as the monetary authorities have developed policies with reactionary behaviours.

Is it Possible to Reconstruct A Bipolar World?

China's desire to save its foreign trade area from dollarization stems from its increasing foreign trade volume and its hegemony over prices of goods and services. Even with Japan in more recent times, $29 billion swap agreement signed in Beijing administration to break dollarization, in this regard the European Union, Russia and Turkey also received the support of the state (SCMP, 2018). However, in the unipolar world order, the US dollar is a money that has both reserve and convertibility in almost every country. China's dreams of yuanization, barely the RMB must be open to convertibility at least in countries in the region. As a complement to this, it has to be a reserve money. In the case of the European Union, the Euro currency maintains its convertibility in countries other than European countries as well as other commercial and financial relations.

The world can no longer be unipolar and can be re-established into the bipolar order. For this purpose, the volume of production and foreign trade, the volume of transactions in the financial markets, can convert the route into a bipolar order. However, in the short and medium run, no matter how much production and export is done by China, no matter how much the capital markets are traded, regular and continuous increase in the transaction volume is required in order for the regional markets to be indebted. In the figure 2 above, it is seen that growth figures do not progress as before. In addition, if the dollar-indexed markets have taken many years, the long-run waiting period for the realization of the yuanization will be required.

Figure 2: GDP Growth of the PRC between 1990 and 2017 (WORLDBANK, 2018b).
The most important structure that we face in the context of the Yuanization initiatives is the Asian Infrastructure Investment Bank (AIIB), where even developed European countries are partners (AIIB, 2018). In the literature and diplomacy, it is known that AIIB was established for alternative purposes to the IMF and the World Bank. The purpose of the institution, which is half of the company's capital, is to provide the necessary funds for the development of Asian countries. Even when viewed from this perspective, it can be concluded that it is not possible for Yuanization to take place in the short and medium run. Because, considering that the World Bank and the IMF, which played an important role in the dollarization of the markets, were established in the 1940s, the long-run and stable studies result. Different conditions of conjuncture, in other words; with the rebuilding of countries that lost huge losses in the aftermath of World War II, today's development moves are different.

Conclusion and Evaluation

Market actors’ desire to buy expectations and sell realities is a typical feature of the market economy. If market interventions increase, sales increase and if the interventions decrease, purchases decrease. We're talking about two big economies. However, in the face of the possibility that these two locomotives are able to restore the world to the bipolar order, that China wants to protect its domestic currency, to use the RMB as a means of payment and to make regional and international initiatives for this, reveals the possibility of a new convertible and reserve money on the markets.

Historical facts show that such a chance is not possible in the short and medium run. For the realization of the Yuanization dream, it was necessary to make the 1978 reforms more earlier, and to ensure the long-run sustainability of the Chinese Miracle that emerged in export-based production and economic growth figures shortly after the reforms. China has had to reduce the production scale in recent years due to the low per capita income and the low number of qualified employment. Accordingly, production-related growth rates are reduced.

Notes

1. The People’s Bank of China (PBC or PBoC), established in 1948. Yet, it has whole banking responsibilities until 1983. After the reforms, in 1983, the PBC obtained its own central banking role (PBC, 2018). Nevertheless, the PBC has never been able to gain its autonomy. It has always been under the control of the central government.

2. Renminbi (is also called as RMB abbreviation), is the name of the PRC’s money. It does not mean a currency. The RMB’s currency is Yuan.

References


The Relationship between Crop Production and Food Inflation in Nuts-2 Regions

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Abstract

Inflation is one of the most important macroeconomic problems of the countries. Food inflation may rise periodically depending on many factors such as unplanned and insufficient production, price fluctuations, exchange rates and demand level. Compared to the same period of the previous year in Turkey, price levels in food and non-alcoholic beverages in October 2018 increased by 29.2% while the producer price index for agricultural products increased by 16.02%. Thus, these figures indicate that Turkish economy has high inflation rates on both the producer and consumer sides in recent years. To this end, the relationship between food inflation and crop production in the NUTS-2 regions in Turkey is investigated by using panel data methods for the period of 2005-2017.

Keywords: Crop Production, Food Inflation, Panel Data, NUTS-2 Region.

Introduction

In addition to meeting the basic needs of the population, agriculture has the function of contributing to employment and providing basic inputs to other sectors of the economy. Due to the mission of meeting the nutritional needs of the population, the prices of food products should be monitored persistently. In Turkey, factors such as unplanned and inefficient production, urbanization, lack of organization, supervision and surveillance, high number of intermediaries, climate changes and exchange rate volatility cause uncertainties in prices of food products. Price uncertainties can cause producers to be led into the cobwebs. According to statistics of Turkish Statistical Institute (TUIK), the prices of food and non-alcoholic beverages increased 29% in 2018, while crop production decreased by 4.2% in cereals and other vegetable products, 3% in vegetables and 1.7% in fruits. There is a possibility that there may be a relationship between the decrease in crop production quantities and the increase in food prices in terms of the supply-demand relationship.

There are some recent studies on the relationship between the agricultural production and food prices (Çelik and Özbay, 2015, Erdal, 2006, Çelik, 2014, Doğan and Gürler, 2013). Koyck and Almon lag model has been used in general. The study for determinants of the food inflation was made by Eren et al in 2017. In this study, determinants of food inflation in Turkey were investigated using VAR techniques for the period of 1994-2016. The study results showed that the variables that affect the consumer prices in the strongest way were the price paid to the producer and the amount of production supplied domestically. Ahsan et al (2014), investigated the determinants of food prices in Pakistan for the period of 1970-2010 by using ARDL method. They used the food prices, subsidy, real per capita income, food production, money supply and World food prices as variables in the econometric analysis. According to the empirical results, food production had a negative effect on food prices. Tadesse et al. (2014) analyzed the main triggers of the international price increases in food products using the Seemingly Unrelated Regression method and concluded that production shocks were negatively affected by the prices in the periods examined (1986-2009 and 2000-2009).

Durevall and Scö (2012), studied the main drivers of inflation in Ethiopia and Kenya by using single-equation error correction models. Findings showed that the domestic food supply shocks were clearly important in Ethiopia, where large harvests reduced inflation through its effect on domestic food prices.
Considering the studies conducted; it was observed that the determinants of food inflation were mainly discussed at the macro level, and the relationship between agricultural production and agricultural product prices was analyzed specifically on agricultural product basis. In this study, the relationship between the value of crop production and food inflation was analyzed at micro level (in NUTS-2 regions) in accordance with the supply-demand law. In this context, the study was designed as follows: Firstly, the data set and methodology related to the subject were followed by the main findings. After testing the reliability of the results, the study was completed with the conclusion and discussion section.

Data and Methodology

In study, the relationship between crop production value (LNCROP) and food inflation (LNINF) in the 26 sub-regions in Turkey was investigated using the panel data methods (Dynamic Common Correlated Effects Mean Group Estimator-DCCEMG, Dynamic Common Correlated Effects Pooled Estimator-DCCEP and Arellano-Bond (1991) Estimator-GMM) for the period of 2005-2017. The amount of crop production was obtained by multiplying the crop production area with the average yields of the products in that year. Crop production values were calculated by multiplying the production amounts with the prices. Food inflation data are the statistics for the food and non-alcoholic beverages expenditure group. The regional statistics were obtained from the database of the Statistics Institute of Turkey. Table 1 contains the descriptive statistics of the variables. The data set consists of 338 observations in total.

<table>
<thead>
<tr>
<th>Variables</th>
<th>LNINF</th>
<th>LNCROP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>2.216142</td>
<td>14.66681</td>
</tr>
<tr>
<td>Median</td>
<td>2.276241</td>
<td>14.86573</td>
</tr>
<tr>
<td>Maximum</td>
<td>2.925846</td>
<td>16.35376</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.993252</td>
<td>12.18689</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.339152</td>
<td>0.930959</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.674530</td>
<td>-0.654058</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>3.035652</td>
<td>2.648323</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>25.64902</td>
<td>25.84070</td>
</tr>
<tr>
<td>Probability</td>
<td>0.000003</td>
<td>0.000002</td>
</tr>
<tr>
<td>Sum</td>
<td>749.0559</td>
<td>4957.383</td>
</tr>
<tr>
<td>Sum Sq. Dev.</td>
<td>38.76304</td>
<td>292.0730</td>
</tr>
<tr>
<td>Observations</td>
<td>338</td>
<td>338</td>
</tr>
</tbody>
</table>

In this study, we employed DCCEMG and DCCEP (xtdcce2 Mean Group and Pooled estimator) proposed by Ditsen (2006). Some advantages of this estimator are: i) it estimates dynamic common correlated effects and allows homo and heterogeneous coefficients, ii) it allows for endogenous regressors, iii) it supports balanced and unbalanced panels, iv) it calculates CD test, and v) it enables small sample time series bias correction. The DCCEMG and DCCEP (xtdcce2) estimator can be formulated as:

1 This regions are: TR10 (İstanbul), TR21 (Tekirdağ, Edirne, Kırklareli), TR22 (Balıkesir, Çanakkale), TR31 (İzmir), TR32 (Aydın, Denizli, Muğla), TR33 (Manisa, Afyon, Kütahya, Uşak), TR41 (Bursa, Eskişehir, Bilecik), TR42 (Kocaeli, Sakarya, Düzce, Bolu, Yalova), TR51 (Ankara), TR52 (Konya, Karaman), TR61 (Antalya, Isparta, Burdur), TR62 (Adana, Mersin), TR63 (Hatay, Kahramanmaraş, Osmaniye), TR71 (Kırıkkale, Aksaray, Niğde, Nevşehir, Karşehir), TR72 (Kayseri, Sivas, Yozgat), TR81 (Zonguldak, Karabük, Bartın), TR82 (Kastamonu, Çankırı, Sinop), TR83 (Samsun, Tokat, Çorum, Amasya), TR90 (Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane), TRA1 (Erzurum, Erzincan, Bayburt), TRA2 (Ağrı, Kars, Igdir, Ardahan), TRB1 (Malatya, Elazığ, Bingöl, Tunceli), TRB2 (Van, Muş, Bitlis, Hakkari), TRC1 (Gaziantep, Adıyaman, Kilis), TRC2 (Şanlıurfa, Diyarbakır), TRC3 (Mardin, Batman, Şırnak, Siirt).
Empirical Results

In this study, 26 sub-regions located in Turkey were selected as the cross sectional unit in order to test the relationship between the value of crop production and food inflation. There are common economic activities between regions. This study aims to explore whether there was a cross-sectional dependence among the regions. To this end, cross-sectional dependency test of Pesaran CD (2004) was performed and the main findings of the test were summarized in Table 2. The Pesaran CD test run under the \( H_0 \) hypothesis expressing the cross section independence. For both LNINF and LNCROP variables, the hypothesis \( H_0 \) can be rejected at the significance level of 1%, indicating that there was a cross-sectional dependence between units. The fact that there was a horizontal cross-section dependency requires the use of second-generation unit root tests that take this into account. The CIPS test performed for this purpose showed that the series were stable, i.e. \( I(0) \) at the levels of the series (see Table 2).

The relationship between food inflation and crop production value was first tested using DCCEMG, DCCEP and GMM estimators. According to the results given in Table 3, LNCROP variable was negative and statistically significant in DCCEP and GMM estimators, but it was not significant in DCCEMG estimation. According to the DCCEP estimator, a 1% increase in crop production would reduce food inflation by about 0.09%.

Robustness Checks

To check for robustness, we applied the Mean-Group Estimator (MG) of Pesaran and Smith (1995), the Pooled Mean-Group Estimator (PMG) and the Dynamic Fixed Effect Estimator (DFE) of Pesaran, Shin, and Smith (1997, 1999), Common Correlated Effects Mean group (CCEMG) and the Common Correlated Effects Pooled Estimators (CCEP), proposed by Pesaran (2006), Augmented Mean Group Estimator (AMG) proposed by Eberhardt & Bond, (2009) and Eberhardt & Teal, (2010). Table 4 shows the results of the MG estimator developed by Pesaran and Smith (1995) and the PMG and DFE estimators developed by Pesaran, Shin, and Smith (1997, 1999). Accordingly, LNCROP variable was found to be negative and statistically significant in all estimators.
Variables/Estimators | PMG          | MG           | DFE         |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LNCROP</td>
<td>-.1575758***</td>
<td>-.1546167***</td>
<td>-.1333842**</td>
</tr>
<tr>
<td></td>
<td>(.0461348)</td>
<td>(.0239932)</td>
<td>(.053654)</td>
</tr>
</tbody>
</table>

As can be seen from Table 5, the findings of the CCEMG and CCEP estimators developed by Pesaran (2006) and the AMG estimator proposed by Bond & Eberhardt, (2009) and Eberhardt & Teal, (2010) produced significant results only in the AMG estimator. According to this estimator, an increase of 1% in LNCROP would reduce LNINF by 0.09%. In general, it could be stated that the AMG, DCCEP and GMM estimators produced the similar results.

Table 5: Robustness Checks Using CCEMG, CCEP and AMG

<table>
<thead>
<tr>
<th>Variables/Estimators</th>
<th>CCEMG</th>
<th>CCEP</th>
<th>AMG</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNCROP</td>
<td>.0224342</td>
<td>-.0534423</td>
<td>-.0917076***</td>
</tr>
<tr>
<td></td>
<td>(.1206101)</td>
<td>.097717</td>
<td>(.025124)</td>
</tr>
</tbody>
</table>

Conclusion

In this study, the relationship between crop production and food inflation in Turkey was analyzed using panel data methods. The basic findings of xtddce2-Pooled and GMM estimator showed that there was a negative and statistically significant relationship between series. According to xtddce2-Pooled estimator, a 1% increase in crop production would reduce food inflation by 0.09%. Therefore, robustness check analyzes were performed for the reliability of the findings. In this context, PMG, MG, DFE, CCEMG, CCEP and AMG estimators were used. PMG, MG, DFE and AMG estimators produced significant results while CCEP and CCEMG estimators did not yield significant results. PMG, MG, DFE and AMG estimators showed similar results with xtddce2 and GMM estimators. Overall, the findings coincide with the economic expectations that in order to reduce food inflation, it is necessary to increase the crop production. In order to increase the crop production, it is necessary to carry out land reform and production plan, prevent fertile agricultural lands from converting nonagricultural uses, adopt environmentally friendly technologies, and take the necessary steps against climate changes.

References


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