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Early Childhood Cooperative Behaviors through HighScope Approach in Thailand

Sudthiporn Chatathicoon, Sampan Thinwiangthong and Duangmanee Ya-amphan
Khon Kaen University, Thailand

Cooperative behaviors are very important for human lives, works and society in 21st century. It has been recognized by educators around the world that is a one of the most crucial factors for successful in complex problem solving and sustainable peaceful lives. This research was conducted in the context of Thai early childhood classroom. The objectives were to 1) compare the early childhood students' scores of cooperative behaviors before and after the implementation of HighScope approach and to 2) analyze the early childhood students' cooperative behaviors through the HighScope approach. Mixed research methodology was employed in this study. The pretest-posttest control group design was conducted mixing by the analytic description method. The experimental group consisted of 42 students from 84 students by cluster random sampling and the control group consisted of 42 students. They were studied in kindergarten during the first semester of the 2019 academic year at the Khon Kaen University Demonstration School. The research instruments consisted of lesson plans, cooperative behavior evaluation form, field notes, and a photo camera. Data were collected by 3 raters blind evaluating the students' cooperative behavior, and 3 researchers taking field notes and photos. The data were analyzed by statistics (mean, S.D., t-test), and framework of Holz (2013). The results revealed that the experimental group students' post-cooperative behavior score (mean = 3.71, S.D. = 0.06) higher than the pre-cooperative behavior score (mean = 3.45, S.D. = 0.06) with the statistical significance at the level of .01 and t-value of 5.46. Moreover, they demonstrated cooperative behaviors: social skills, expression of ideas, choice and decision making, feeling perception and conflict resolution, which are basis to form cooperative habit of mind. Teachers and educators could use HighScope approach to design instructional activities that promote students' cooperative learning meaningfully.

Keywords: cooperation, cooperative behaviors, early childhood students, highscope approach

Correspondence concerning this article should be addressed to Dr. Sampan Thinwiangthong, Assistant Professor in Mathematics Education, Chairperson of Ph.D. Program in Mathematics Education, Department of Mathematics Education, Faculty of Education, Khon Kaen University, Muang District, Khon Kaen 40002, Thailand**,** E-mail address: sampan@kku.ac.th

Cooperation lies at the heart of human lives and society from day-to-day interactions to some of our greatest endeavors. Understanding cooperation—what motivates it, how it develops, how it happens, and when it fails— is therefore an important part of understanding all forms of human behavior **(**Kousta, 2018**).** Cooperation is important in several settings, including behavioral interactions, biological evolution, sociobiology, cultural dynamics, and collective intelligence (Montoreano & Jaffe, 2020). Cooperative behavior has become a focus of research since the organizations started to structure employees into terms or groups, such as management terms, project groups, or self-managed terms (Cohen & Bailey, 1997). In the context of school, especially in the classroom, teachers should deliberately create opportunities for students to cooperate, share responsibilities, solve problems, and control conflict. These opportunities can be found in cooperative learning that differs from individualistic or traditional learning, where the students work independently (Kelly, 2019). In recent years, there has been an increasing focus on cooperation. It has been identified as an important educational outcome in its own right, rather than only as a means to develop or assess knowledge, which is learned through engagement and practice (Child & Shaw, 2016). As mentioned earlier, it is imperative to cultivate the importance of cooperation among students in the 21st century while also promoting it as a characteristic of the people in society.

Although cooperation is extremely important; however, in the context of Thai classrooms, several classrooms did not prepare the students with cooperation activities appropriately. Some of the people lack appropriate social thoughts and attitudes, they lack cooperation skills even if they are smart and talented, and they cannot solve social problems **.**According to The Quality Learning Foundation, Thailand (2019) stated that Thai children have the learning and innovation skills as any children from other nations in the world, but they lack the cooperation skill for teamwork. It is in the life and occupation skills that affected communication skills. The lack of cooperation skills is the result of the traditional teaching approach. Phanich (2019) and The Quality Learning Foundation, Thailand (2019) mentioned that most Thai teachers still use the teaching approach that focuses on the students' memorization of contents, which negatively affects students' leadership and cooperation skills. Balliu and Belshi (2017) indicated that the traditional methods consider teachers as the center of the teaching process as well as the managers and the main and referential source of scientific information, which does not help develop the practical skills of the students. Tularam and Machisella (2018) suggested that the traditional teaching approaches are generally teacher-directed, wherein the students are taught in a manner that is conducive to sitting and listening only. It is often argued that these approaches may not provide students with valuable learning skills. Phanich (2016) suggested that the focus of the education system has to change from teacher's teaching to student's learning, from individual learning to team learning, and from competition to cooperation. Children's cooperation could be observed through cooperative behavior. Therefore, teachers must change the traditional teaching approach to newer teaching approaches that focuses on the students' cooperative behavior. Especially, early childhood students should be prepared by engagement in cooperative learning and by encouraging expression of cooperative behavior, because the preschool stage is the golden age of life and the age of laying important foundations both

physically, emotionally, mentally, socially, intellectually, morally, and ethically. According to Khammanee (1993) and Chingchana (2004), children aged 12 months to 6 years could learn to cooperate with others and play with others in a friendly manner, cooperative behavior, and likes to do things to please others.

The teachers who expect to organize activities to promote cooperation behavior for early childhood students in the classroom context should be able to recognize the importance of cooperation and should be able to arrange the activities according to the children's interests and needs. Moreover, they need an appropriate approach for teaching that encourages children's cooperative behavior. There are several approaches for increasing children's cooperative behavior that has been mentioned in past studies (see Zill, O'Donnell, & Sorongon, 2003; UNICEF, 2015; Brown, 2016; Capraro, Jagfeld, Klein, Mul, & van de Pol, 2019; Curtin & Jia, 2020). These research studies provide the importance of cooperative behavior as terminology for future study and some of the interventions to increase cooperative behavior. The HighScope is one of the approaches that encourage cooperative behavior in the classroom context, create learning activities for children to have the opportunity for interaction with others and participate in learning activities with a group through the important step including plan, do, and review (Zill, O'Donnell & Sorongon, 2003; UNICEF, 2015). HighScope was designed by Weikart, Hohmann and Schweinhart, in 1962 focusing on child development through active learning and playful active engagement in real-life experiences using real materials (Hohmann & Weikart, 1995). The HighScope, including plan-do-review activities, was recognized by several educators who encourage students to construct knowledge by themselves (French, 2012). The HighScope approach emphasizes child-initiated learning activities for preschool and elementary school children. The strongest evidence depicts that it helps children living in poverty to achieve greater success and responsibility throughout their lives (Schweinhart & Weikart, 1999). Cooperative play is one of the key development indicators in social and emotional development within the HighScope approach (Epstein, 2014). The results of the HighScope approach highlighted that, for the children, they could cooperate with other children. The children could be expected on social skills with peers, that is they could learn to share and cooperate with other children, to respect them, and to understand their feelings (UNICEF, 2015). Moreover, the HighScope approach have arranged the classroom and children's daily routine with thought and intention, implement a child-center approach to problem-solving and conflict resolution and created a cooperative environment (Delgado, 2018).

Social learning of children requires cooperation. The children who accept their friend's opinions, feelings of others' emotion, knowing and sharing their understanding, and showing leadership as well as fellowship skills in group working could perform cooperative behavior. Early childhood students are of an appropriate age for promoting their cooperative behavior to cultivate good character traits (Krogh, 1990 cited in Siriwattananon, 2001). Cooperative behavior is acting or functioning in a specified, desired way with each other. In addition, before we can expect children to have self-discipline, we need to assist them to deal with emotions and feelings and provide them with an environment in which they can relate to others in a calm manner (Holz, 2012). Student behavior within cooperative groups has consistently reported that students who

gain most from cooperative work are those who give and receive elaborated explanations (Webb, 1985; 2008). Student cooperative behavior could be found in cooperative learning, referring to instructional methods in which teachers organize students into small groups, which then work together to help one another learn academic content (Slavin, 2011). Six tips to encourage cooperative behavior in children including focus on what they can do, role model cooperative behavior, offer choices, praise and reward specific behavior, consider the child's feelings and be patient (Bonker, 2020). Cooperative behavior could be considered based on 5 aspects including social skills, ideas expression, choice and decision making, feeling perception, and conflict resolution (Holz, 2012). An appropriate teaching approach could develop early childhood students' cooperative behavior. Therefore, teachers have to consider and implement teaching approaches to enhance cooperative behavior for early childhood students.

By the aforementioned rationale, cooperative behavior is extremely important for early childhood students. Teachers and researchers could prepare their children by using the teaching approach. This study determines the hypothesis that HighScope approach is a teaching approach that might enhance early childhood students' cooperative behavior. This research focuses on the development of early childhood students' cooperative behavior by using HighScope learning activities including plan, do, and review processes. The result of this research will be useful for early childhood teachers and researchers in designing appropriate learning activities for early childhood students.

Literature Review

HighScope Approach

The name 'HighScope' refers to the high purposes and far-reaching mission of a model of education originating in the USA. Its goal is to improve the life chances of children and young people by promoting high-quality educational programs. The HighScope approach was designed by Weikart et al., beginning in 1962, '. . . in response to the persistent failures of high school students from Ypsilanti's poorest neighborhoods' (Weikart, Deloria, Lawser, & Wiegerink, 1970; Hohmann & Weikart, 1995). HighScope is a quality approach to early childhood care and education that has been shaped and developed by researches and practices >50 years. It identifies and builds on children's strengths, interests, and abilities (HighScope Ireland Institute, 2020). The HighScope Educational Research Foundation has conducted a comparison study of 3 groups of children, consisting of direct instruction, a traditional nursery, and HighScope. Based on these studies, from early childhood to 23 years of age, they found that those who study with the HighScope programs have fewer social-emotional behavior problems, such as being arrested for stealing, hurting others, emotional disability, and failure in life. Therefore, this program is proven to help prevent criminals from enhancing educational success and lifelong productivity (Schweinhart & Weikart, 1997; Wilson, 2000). In an HighScope setting, the children learn through a three-phase cycle: plan, do, and review (French, 2012; Izadpanah & Gunce, 2014). Pholyothin et al., (2013) have defined organizing the process of HighScope approaches, as follows.

Planning. The first step is the child's thinking process about the goals that define expected actions. The child's planning depends on their age. Communication and language ability allow children to make plans through gestures or words. Planning is important because it supports ideas, clear selection, and decision-making in children, as well as promotes a child's self-confidence and a sense of self-control, which encourages children's interest in the planned play to promote the development of playing with more complex.

Do or work time. The second step is a time when children act, play, and solve problems with a purpose, concentration, and learning based on their experience. Working time is the period in which a child has complied with what he had intended. Discovering new ideas is a time when the children have to choose and decide to use materials and equipment to play.

Reviewing or recall time. The last step is the review period is where the child reflects, talks, and presents about what is done during work. In the review process, children understand by using language, discussion, and analysis, reflecting their thoughts about actions and experiences. It is the process of creating an understanding of what has been done. The children who are aware of the implications due to the work plan and the results obtained. They talk to others about their experience. It is a good opportunity for the children to practice the narrative of the narration, and the children will practice their ability to demonstrate to others. They understand that their experience realizes the past. The review causes the child to reflect on the original goal set. Actions that have been surveyed or planned improvements and the products that are currently received causing them to consider from the past which is present and future indicators, it is a skill that can be used in life.

The HighScope approach emphasizes child-initiated learning activities for preschool and elementary school children. The strongest evidence indicates that it helps children living in poverty to achieve greater success and responsibility throughout their lives (Schweinhart & Weikart, 1999). The advantage of HighScope has been supported by research studies (see Hohmann & Weikart, 1995; French, 2012), especially, it has encouraged cooperative behavior (see Epstein, 2014; UNICEF, 2015; Delgado, 2018).

In conclusion, organizing experience in the HighScope approach consists of 3 important phases. The first one is the planning phase—a process in which children think, make decisions, and talk about things they want to do based on their interests. They think about activity methods as well as talk about which activities they want to do next. The second phase involves action or "to do". In this phase, children perform the planned activities. The children have to do activities by themselves based on their plans. The third phase is to review. It involves a presentation about what to do during work activities. For this research, we adapted the 3 phases of HighScope for designing and implementing the children's activities and to observe the children's cooperative behavior through learning activities. This research hypothesized that HighScope approach could support the early childhood students' cooperative behavior.

Cooperative Behavior

Cooperation lies at the heart of human lives and society. Human beings are a social species that rely on cooperation to survive and thrive. Understanding how and why cooperation succeeds or fails is integral to solving several global challenges (Kousta, 2018). Cooperation is one of the most important themes for modern organizations. Cooperation, as a synergistic force, is at the core of the organizational process driving organizational effectiveness (Chen, Chen, & Meindl, 1998; Smith, Carroll, & Ashford, 1995; Schalk & Curseu, 2010). Cooperation was structurally created by the involvement of two or more participants to perform tasks and activities (Anderson & Caldwell, 2018). Cooperation is an important component of a human career and success in work and life. It is the heart of the interaction among individuals, families, and society and an inevitable part of life (Chingchana, 2004). Cooperation should start from early childhood because early childhood is the golden age of life—it is the age of laying important foundations in the areas of physical, emotional, societal, intellectual, moral, and ethical behaviors (Khammanee, 2016; Chingchana, 2004). Early childhood cooperation could be observed through cooperative behavior. Early childhood students are at an appropriate time to promote their cooperative behavior to cultivate good character traits (Krogh & Roos, 1996; Siriwattananon, 2001). Cooperative behavior is acquired through cooperative learning, which involves the instructional use of small groups of students who work together to maximize their own and each other's learning (Slavin, 2011; Johnson & Johnson, 2017).

The meaning of cooperative behavior can be explained using the root of vocabulary. To 'co-operate' is to work or act together or jointly and to be of assistance. Therefore, to be 'co-operative' is to be willing to 'co-operate', be helpful, and act in conjunction with others. It is to do with communicating and interacting with others and involves empathy and self-discipline. Cooperative behavior is acting or functioning in a specified, desired manner with each other (Holz, 2012). The basic elements of the cooperative team, include positive interdependence, individual accountability, face-to-face promotive interaction, interpersonal and small-group skills, and group processing (Johnson, Johnson, and Smith, 1998). For early childhood students, there are some important aspects of cooperative behavior, including social skills (e.g., taking turns, dividing and sharing resources, and working cooperatively), children's expression of ideas (to be guided by children's interest and encourage ideas), choice and decision making (allowing plenty of opportunities to make their own choices and decisions), feeling perception (to use role-play for children to explore their feelings), and conflict resolution (to use role-play for children's practice of conflict resolution) (Holz, 2012). This research was based on 5 important aspects, according to Holz (2012), to determine the early childhood students' cooperative behaviors.

For this research, the conceptual framework consisted of the variables including pre- and post-stage cooperative behaviors and HighScope approach. The pre-stage students' cooperative behaviors were evaluated by 3 teachers at the beginning of the semester in classrooms by implementing the HighScope approach (Plan-Do-Review activities) and focusing on cooperative behaviors. HighScope is a treatment that affects students' cooperative behaviors. Teachers design learning activities by considering how

to encourage the students' cooperative behaviors. They teach and observe the students' cooperative behaviors. The qualitative data of students' cooperative behaviors was investigated by the researchers in this study. Finally, post-stage students' cooperative behaviors were evaluated by 3 teachers at the end of the semester. The conceptual framework has been depicted in Figure 1.

Figure 1: Conceptual Framework

Method

This research implemented mixed methods, type II embedded research design (Creswell, 2007) by collecting and analyzing quantitative and qualitative data. The quantitative part was conducted by the pretest-posttest control group design (Campbell & Stanley, 1963) and the qualitative part was employed by the analytic description method based on framework of cooperative behaviors (Holz, 2012). The research questions including of whether the post-stage early childhood students' cooperative behaviors in which after implementation of HighScope approach higher than the pre-stage early childhood students' cooperative behaviors? and what are qualitative evidences of early childhood students' cooperative behaviors after implementation of HighScope approach? We investigated the quantitative pre-stage data and the results of the early childhood students' cooperative behaviors, along with the qualitative data and the results of the early childhood students' cooperative behaviors, and, finally, the post-stage data and results of the early childhood students' cooperative behaviors. The research design for quantitative part is show in Figure 2 and the details of our research methodology are as follows.

R	O1	X	O2
R	O3		O4

Figure 2: Research Design (Campbell & Stanley, 1963)

Research Instruments

The research instrument for collecting quantitative data was the cooperative behaviors evaluation form synthesized by the researcher based on the framework of Holz (2012) and verified by 2 experts in the field of early childhood education and an expert in educational assessment. The determination of cooperative behaviors is depicted in Table

1. Moreover, the instruments for collecting qualitative data were field notes for taking notes of the early childhood students' cooperative behaviors, a photo camera, and worksheets.

Table 1
Determination of Cooperative Behaviours

Score	Interpretation
1	The students' cooperative behavior needs to improve
2	The students' cooperative behavior is at a fair level
3	The students' cooperative behavior is at a good level
4	The students' cooperative behavior is at a very good level

Participants

The experimental group consisted of a classroom of 42 kindergarten students during the 1st semester of the 2019 academic year in the Demonstration School, Khon Kaen University, Thailand. These students were statistically selected by cluster random sampling (Gall, Brog, & Gall, 1996; Kerlingger, 1986). Each class was a mix of all students' abilities (excellent, good, fair, and poor). One classroom out of two classes comprised of 84 kindergarten students, which served as the experimental group. Additionally, another classroom consisted of 42 kindergarten students were the control group. The teachers and all the students in these classes contented to participate in this research.

Data Collection

Research data were collected by 3 teachers as raters who are blind between themselves. The raters evaluated the individual student's cooperative behaviors, in both of the experimental and control groups, at the beginning of the semester using the cooperative behaviors evaluation form and determining the score (Table 1). Then, the HighScope approach was implemented as the intervention for the experimental group. The researchers took field notes and recorded the photos of the experimental group students' cooperative behaviors based on the 5 aspects of cooperative behaviors (Holz, 2012) in learning activities and worksheets within the context of the HighScope approach. Finally, the 3 raters evaluated the individual students' cooperative behaviors, in both of the experimental and control groups, at the end of the semester by using the cooperative behaviors evaluation form.

Data Analysis

The quantitative data of the experimental and control group students' cooperative behaviors was analyzed by statistics, that is, using the Mean, Standard Deviation, and t-test for the dependent samples. Qualitative data of the experimental group students' cooperative behaviors was analyzed by applying the framework of cooperative behaviors for early childhood students (Holz, 2012) by using the method of analytic description. The events were determined as unit of analysis (Steffe & Thomson, 2000) and the protocols and pictures were considered as empirical data conform to the framework of cooperative behaviors.

Results

The Quantitative Result of the Comparison of the Early Childhood Students' Pre- and Post-Stages Cooperative Behaviors

The early childhood students' cooperative behaviors between the pre- and post-stages of implementation of the HighScope approach is depicted in Table 2.

Table 2
The Early Childhood Students' Pre- and Post-Stages Cooperative Behaviors

Group of Students	Period	Number of Students	Mean	SD.	t	df	sig
Experimental Group	Pre-stage	42	3.45	0.06	5.46	41	.00**
	Post-stage	42	3.71	0.06			
Control Group	Pre-stage	42	3.44	0.06	1.35	41	.09
	Post-stage	42	3.51	0.04			

**statistical significance at the level of .01

According to the statistics shown in Table 2, the experimental group students have a higher post-stage average score ($\overline{x}$ = 3.71, *SD.* = 0.06) on cooperative behaviors than the pre-stage average score ($\overline{x}$ = 3.45, *SD.* = 0.06), with their statistical significance at the level of .01 and the t-value of 5.46. For the control group students, they have a post-stage average score ($\overline{x}$ = 3.51, *SD.* = 0.04) on cooperative behaviors no different from the pre-stage average score ($\overline{x}$ = 3.44, *SD.* = 0.06) which was considered at the level of .01 of statistical significance with the t-value of 1.35. These statistics indicated that the implementation of the HighScope approach could improve the early childhood students' cooperative behaviors.

The Qualitative Result of Early Childhood Students' Cooperative Behaviors

The experimental group students' cooperative behaviors were based on the following 5 aspects of cooperative behaviors.

Social skills. The early childhood students could work together cooperatively. They could divide and share colored pencils for painting pictures in their group work. They could share responsibilities in doing group work. These were pieces of evidence to demonstrate that they possessed social skills. The early childhood students' social skills have been depicted in following episode and Figure 3.

Oil: We can color our work together.
Win: Yes, all right, beautiful work is performed by everyone
San: You can use my colored pencil to do that part, I will do this part, we will finish on time.

Figure 3: The Early Childhood Students' Social Skills

Expression of ideas. The early childhood students could show their ideas in group working and whole-class presentations. They shared their ideas of folding and sticking the paper and also of painting pictures. Moreover, they could express their ideas about a story in their worksheet for the whole class presentation. These are the evidence for the expression of ideas, as shown in episode and Figure 4.

Wa: This is folding and then bring together; it shows lovely boy and girl.
Mo: They go to buy snack together; they share snack to their friend.
Mik: We will present our group work, the boy and the girl go to a shop for buying some snack, then they go to school, they give some snack to their friends.

Figure 4: The Early Childhood Students' Expression of Ideas

Choice and decision making. The early childhood students could cooperate with their friends for understanding the characteristics of rice (raw rice, ripe rice, raw sticky rice, ripe sticky rice, and paddy). Then, they cooperated to decide on what types of rice could be used to make grilled rice with egg. This activity provided the students with opportunities to cooperate to make choices and decisions. Finally, they could complete the task of preparing grilled rice with egg and felt proud of their skills. The episode and pictures in Figure 4 represent choice and decision-making.

Teacher: So, we have raw rice, ripe rice, raw sticky rice, ripe sticky rice, and paddy, which one you select to make grilled rice, why?
Na: I will select…ummm…... ripe sticky rice, I used to saw from the street market.
Toto: Ripe sticky rice, it could be molded into various shape.

Figure 5: The Early Childhood Students' Choice and Decision Making

Feeling perception. The early childhood students could perceive the feeling of their friends. They could perceive not only the positive feeling but also the negative feeling of their friends during cooperative working. Feeling perception allowed the early childhood students to adjust their positions when dealing with their friends and sustain a cooperative working style to accomplish the common purpose. The evidence of feeling perception has been shown in Figure 6.

Som: We can color these pictures together (smile, happy); we will finish before another group.
Nim: We had finished (smile, happy), you can check our work, it is good, you are so careful.
Sun: You calm down please, I am in a hurry, we will complete our work on time.

Figure 6: Images Depicting Early Childhood Students' Positive and Negative Feeling Perception

Conflict resolution. The early childhood students' conflict resolution occurred during cooperative working. When some of the students did not agree with their friends during group work, another child tried to negotiate to sustain the group working system until the common purpose was achieved. The below episode and Figure 7 reflect the evidence of conflict resolution.

Max: Why you paint my picture?
Bow: Is it good?
Max: No, I do not need anybody to paint my picture.
Pink: The time is almost over. Bow would like to help you. Our group will complete quickly.
Sun: I agree.
Max: Umm…okay.

Figure 7: Image Depicting Early Childhood Students' Conflict Resolution

The summary of the present research obtained from the qualitative data analysis revealed that cooperative behaviors involved 5 aspects: 1) Social skills—the early childhood students' ability to work together, divide, and share color pencils as well as share responsibilities when doing group work; 2) Expression of ideas—the early childhood students could demonstrate their ideas to their peers in group working and also to the whole class during the presentation. The students' ideas could be shared in both small and large groups; 3) Choice and decision making—the early childhood students could cooperate with their friends to understand the choice, then cooperate to make decisions based on everyone opinions; 4) Feeling perception—the early childhood students could perceive the positive and negative feelings of their friends during cooperative working tasks, and they adjusted their position to try and sustain the cooperative work mode to accomplish their common purpose, and 5) Conflict resolution—the early childhood students could resolve conflicts that occurred during their cooperative working. The conflict occurred when some students did not agree with their friends or were not satisfied with the group work, which is when another child tried to negotiate to sustain the group working mode to accomplish the common purpose. The conflict was resolved and the students could continue cooperative work until they achieved their common goal.

Discussion

The quantitative result revealed that the early childhood students in experimental group had a higher post-stage average score of cooperative behaviors than the pre-stage average score with statistical significance. This result indicated that the implementation of the HighScope approach could improve early childhood students' cooperative behaviors. This result is a consequence of the activities in the HighScope approach that were designed using plan, do, and review corporate activities with cooperative features in group working. Remarkably, the version of HighScope in this study may be called adaptive HighScope, because it could be incorporated with cooperative features. The result supported prior research results by Epstein (2014), UNICEF (2015), and Delgado (2018) who reported that the HighScope approach has encouraged cooperative behaviors. Moreover, the results could confirm the importance of cooperation when the early childhood students worked and learned together. They could maximize their own and each other's learning (Slavin, 2011; Johnson & Johnson, 2017). These results also support the statement by Khammanee (2016) and Chingchana (2004) that cooperation should start from early childhood because early childhood is the golden age of life; it is the age of laying important foundations in the areas of physical, emotional, societal,

intellectual, moral, and ethical behavior. Therefore, we should cultivate cooperative behaviors in students since their early childhood period.

The qualitative result found that the early childhood students' cooperative behaviors consisting of 5 aspects. The first aspect was social skills—the early childhood students could work together, divide and share the color pencils, and shared responsibilities when doing group work. These skills could mainly be performed in small group work according to the small group skills and group processing (Johnson, Johnson, & Smith, 1998). Moreover, the students were split into small collaborative groups during the activities, which lead to the creation of a suitable educational environment, which helped them in understanding the information, applying it in new situations, analyzing it, synthesizing it, and finally assessing it (Elsayed, Abbas, & Abdou, 2021). These results inferred that social skills, small group skills, and group processing could support each other. On the other hand, social skills deficits emerged as significant predictors of cognitive failures, attention deficits and psychological maladjustment in school children (Mukhtar & Naz, 2021). The second aspect was the expression of ideas; the children could demonstrate their ideas to their peers in group working and also in the whole class presentation. The expression of ideas relates to face-to-face promotive interaction and interpersonal skills (Johnson, Johnson, & Smith, 1998). The third aspect was the choice and decision making, wherein the children could understand the choices and make decisions by considering the opinions of all the members of their group. This aspect is related to the idea of democracy in group work, which is important for the students in daily life. The fourth aspect was feeling and perception; the early childhood students could perceive the positive and negative feelings of their friends and they adjusted their positions and tried to sustain cooperative work to accomplish common goals. This aspect deals with the recognition of the status of emotion. According to Khammanee (2016) and Chingchana (2004), early childhood is the golden age and the age of laying important foundations both physically and emotionally. This stage is best for the foundation of the emotional quotient (EQ). The last aspect was conflict resolution, and it was not easy for the early childhood students to resolve conflict. This study noted evidence of conflict resolution that occurred during students' cooperative working. The episode of conflict resolution in this study is a perfect scenario as it reveals that the early childhood students used the peaceful approach to resolve an issue. Undoubtedly, we would like to see people live in a peaceful society. Hence, we should cultivate a behavior among early childhood students to resolve their conflicts in a peaceful manner. Moreover, we could use the conflict resolution scenario like a role-play for children to practice conflict resolution (Holz, 2012). These scenarios could be used to not only cultivate the early childhood children with cooperative learning, but also design the appropriate learning activities for the next lessons that promote long term habit of mind in cooperation and peaceful mind in their future life.

Conclusions

This research concluded that the HighScope approach can be an important treatment approach for developing early childhood students' cooperative behaviors. Besides, the HighScope approach could appropriately engage early childhood students to perform in group working. Moreover, the students were very enjoining in the learning

activities, including the cooperative plan, do, and review activities. This is an important foundation for early childhood students to develop social skills, express ideas, make choices and decisions, perceive positive and negative feelings, and resolve conflicts.

Early childhood teachers and researchers can learn from the research results and use the design learning activities to conform to the steps of adaptive HighScope–cooperative plan, do, and review–for the early childhood students to cultivate in them a cooperative culture and characterize them with cooperative behaviors. Learning activities should be designed by covering the 5 aspects of cooperative behaviors and the interest of the early childhood students. If early childhood student learns regularly through appropriate activities, they can grow to become adults with cooperative habit and peaceful mind, and hence live in a peaceful society.

Recommendations

Generally, the HighScope approach including the plan, do, and review activities are not necessarily applied with cooperation or group working systems. This research result found the importance of cooperative features of group working; therefore, the early childhood teachers and researchers who liked to promote the early childhood students' cooperative behaviors should recognize the important features of cooperation and cooperate with the HighScope activities, namely with the cooperative plan, do, and review activities.

This research focused on the early childhood students' cooperative behaviors based on the 5 cooperative behaviors (Holz, 2012). Future research may focus on the elements of the cooperative team (see Johnson, Johnson, & Smith, 1998), including positive interdependence, individual accountability, face-to-face promotive interaction, interpersonal and small group skills, and group processing. Another research topic was to study focused on the important aspect of cooperative behaviors, such as conflict resolution. The body of knowledge on conflict resolution and the method to teach early childhood students to resolve conflicts in their classroom and daily life require further exploration.

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Comparative Analysis of Remitted and Non-Remitted Households' Budget Allocation to Food and Non-Food Items in Pakistan

Hazrat Yousaf, Zahid Amin and Iqra Sami
Lasbela University of Agriculture, Water & Marine Sciences, Uthal Balochistan

Globalization has expanded labor market interconnectedness, and countries are striving to take advantage of this opportunity by sending their work force to countries where labor is in demand. On the other side, unfavorable events such as COVID-19 can impose restrictions such as lockdowns, travel bans, and social distance, all of which have caused problems for migrant workers and reduced remitted household budget allocation. Using the two-sample t-test and the PLSM 2014-15 dataset, this study compares the budget allocation of remitted and non-remitted households to food and non-food items. In addition, the distribution of remitted households by province and region, as well as remittance sources also determined. The results show that the Punjab province has the highest percentage of remitted households (51%), while Balochistan has the lowest percentage (1.4%). Furthermore, in Punjab, Bank is the most common channel of receiving remittances, whereas Hundi is in Khyber Pakhtunkhwa. The results of a two-sample t-test show that between remitted and non-remitted families, there is a significant difference in mean monthly budget allocation to food and non-food items. Remitted households spend more on food, education, health, and gas usage than non-remitted households on a monthly basis. As a result, the study suggests that increasing job opportunities both inside and outside Pakistan could be a viable policy option for increasing remitted and non-remitted household budget allocation. Enhancing bank remittances channels could be a viable policy option for increasing remittances and consequently increases households' budget allocation to food and non-food items .

Keywords: Remittances, Household, Budget Allocation, Pakistan
JEL: Q25, D10, F24,

Although globalization has increased labor market connectedness, and countries are attempting to capitalize on this opportunity through migrants of their labor force involvement in labor demanded countries(Rahim & Wahab 2020). Migration in term of labor force has a significant importance in sharing new ideas and efficiency skills in various fields both in developed and developing countries(Ahmed, Sugiyarto, & Jha

Correspondence concerning this article should be addressed to Dr. Hazrat Yousaf,, Assistant Professor Economics, Lasbela University of Agriculture, Water & Marine Sciences, Uthal Balochistan email: dr.yousaf@luawms.edu.pk

2010). Around 3.5 percent of the global population is believed to be residing outside of their native nations, with 63.5 percent of them migrating for work(Government of Pakistan, 2020; Migration and Development Brief, 2018). The migrants to labor-demanding countries is increasing the proportion of the global population living outside their birth countries(Olowa et al., 2013). International migrants (including refugees) climbed from 172 million in 2000 to 258 million in 2017, with high-income nations accounting for most of the rise(Migration and Development Brief, 2018). For economic development and household welfare, external financing through migrant inflows of remittances to developing nations is becoming increasingly important. Remittance inflows to low and middle-income nations were the highest in 2019, totaling $554 million(World Bank, 2020). On the other hand, in the context of remittances, the COVID-19 epidemic has stuck various economic operations, and this epidemic could be long, deep, and ubiquitous. COVID-19 imposed restrictions such as lockdowns, travel bans, and social distance, all of which posed issues to migrant workers. Loss of employment, earnings, food security risk, and loss of remittances to their families are all possible challenges as are facing by migrant workers(Government of Pakistan, 2020). Remittances to low and middle-income countries are predicted to fall by 20% to $445 billion in 2020, from $554 billion in 2019. Thus, the relative importance of remittance flow as a source of external financing to low-and middle-income countries is expected to rise. This is because COVID-19 is expected to diminish the flow of foreign direct investment due to trade restrictions, travel bans, and the wealth effect of a drop in multinational company stock prices(World Bank, 2020).

Remittances to South Asia are expected to decrease by 22% to $109 billion by 2020. This unprecedented drop is attributable to a substantial drop in remittance inflows to South Asia from the United States, the United Kingdom, and EU countries. According to The International Organization for Migration(2020) survey the most common reasons for Pakistani employees migrating to other countries are an insufficient income (33%), unemployment (25%), and financial difficulties/debts (13%). Pakistan was placed second in South Asia in terms of manpower exporting country to Gulf Cooperation Council countries such as Saudi Arabia and the United Arab Emirates, with a 96 percent manpower share(Government of Pakistan, 2020). Pakistan's share of remittance inflows is expected to fall by 23% to $17 billion in 2020, down from $22.5 billion in 2019. Average remittances inflow to Pakistan in the last ten years is $16.6 billion with the major contributor is Saudi Arabia followed by UAE, USA and UK(World Bank, 2020). However, the remittance loss is a severe problem for the household sector in Pakistan, like other developing counties. This is because remitted households are mainly dependent upon on remittances while a constraint such as COVID-19 could influence negatively on households living standards. To address the importance of remittances and the future living standards of the household sector in the face of recent adverse occurrences, this study adds to the current literature by examining the distribution and sources of remittances among remitted households by province and region, and comparison of remitted and non-remitted households' budget allocation to food and non-food items.

Literature Review

The literature contains a substantial debate about the impact of remittances on the growth of a society and the welfare of the household sector. However, the literature shows mixed results on household decisions about remittances allocation to spending, debt, saving, human capital development, labor supply and living standards of household. In the case of developing, the studies investigated the remittances impact on households' consumption, health, education, housing, and utilities. Kapri and Jha (2020), Thapa and Acharya (2017) for Nepal; Yuni et al., (2018) for Nigeria; Mahapatro et al., (2017) for India; Khan et al., (2021) for Pakistan investigated the impact of remittances on household's food and non-food items. The findings of Khan et al., (2021) support the argument that remittance inflow enhances spending on health at household level. Using the Nepal Living Standards Survey 2010-11, Kapri and Jha, (2020) investigated the remittances impact on household health care expenditure. The result shows remittances have a positive impact on health care at the household level. Because a substantial amount of household health care expenditure is based on self-finance, an increase in remittances inflow boosts households' ability to spend more on health care services. In the contest of Nepal, the results of Thapa and Acharya, (2017) show that remitted households spend more on consumption, education, and health than non-remitted households. Remitted households are better off in terms of expenditure on durable goods, education, and health than non-remitted households. Both within and outside Nepal, remittances have a positive impact on health-care spending. Yuni et al., (2018) conducted a comparative examination of remitted and non-remitted households' expenditure habits in Enugu and Anambra, Nigeria. In most expenditure categories, the results show no substantial difference between remitted and non-remitted households' budget allocation. In other words, neither remitted nor non-remitted households significantly alter their budget allocations for health, education, consumption, business, charitable giving, or saving. Mahapatro et al., (2017) investigated households budget allocation to food and non-food items in case of India. The leading category is food where household allocates more budget whose share is 70%, followed by education (35%), health care (33%), and other purposes (33%). However, budget allocation to food, medical, and other categories differ significantly between remittances and non-remittances households. Using the PSLAM (2010-11) dataset, Khan et al., (2021) investigated the nexus between remittances and health care expenditure. It confirms that remittances increase household spending on health care services, based on the findings.

After reviewing the above summarized literature, to best our knowledge the literature on comparative analysis of remitted and non-remitted households' budget allocation to food and non-food items has not been addressed empirically for the case of Pakistan. To fill this gap and add to the existing literature, this study examines (i) the distribution and sources of remittances among remitted households by province and region, and (ii) comparison of remitted and non-remitted households' budget allocation to food and non-food items.

Method

Data Source

The Pakistan Social and Living Standards Measurement (PSLM) 2014-15 dataset is used to survey the study's objectives. The remitted households are chosen based on the survey's reported question: "What is the source of remittances received from within/outside Pakistan?" Because this is a stratified random sampling survey, the sample of households from each province is chosen based on the population size of the province. A total of 1733 remitted, and 22357 non-remitted households are chosen. The study also collects information on household's total expenditure/income, and budget allocation to food and non-food items from the PSLM 2014-15.

Following Mohamed et al., (2021); Yousaf, Ahmed and Ali (2020) and George and Mallery (2018) a comparative analysis of remitted and non-remitted household's budget allocation to food and non-food item is computed as follows:

$$t\text{-}test = \frac{\left(Budget_{\ remitted\ household\ to\ item\ i} - Budget_{\ non-remitted\ household\ to\ item\ i}\right)}{\sqrt{s.e_{remitted\ budget\ allocation\ to\ item\ i}^{\ 2} + s.e_{non-remitted\ budget\ allocation\ to\ item\ i}^{\ 2}}} \quad (1)$$

Equation (1) is basically the mean difference t-test and therefore, the mean value of household budget allocation to food and non-food items uses and $s.e_{remitted\ budget\ allocation\ to\ item\ i}$ and $s.e_{non-remitted\ budget\ allocation\ to\ item\ i}$ are the standard errors. When finding differences between the mean of the two groups, this test is more suited. The ratio of expenditure on food and non-food items to income is used to calculate the mean budget allocation to food and non-food items in share form. Table 1 shows the categories and construction of budget allocations for food and non-food items as well as total expenditure/income.

Table 1

Construction of Data

Variable	Construction	Symbol
Budget Allocation to		
1. Food	It is expenditure made on food divided by total expenditure of household *i*.	$\frac{px_{food}}{total\ expenditure}$
2. Education	It is expenditure made on education items divided by total expenditure of household *i*.	$\frac{px_{education}}{total\ expenditure}$
3. Health	It is expenditure made on health divided by total expenditure of household *i*	$\frac{px_{health}}{total\ expenditure}$
4. Transport	It is expenditure made on transport divided by total expenditure of household *i*	$\frac{px_{transport}}{total\ expenditure}$
5. Electricity	It is expenditure made on electricity divided by total expenditure of household *i*	$\frac{px_{electricity}}{total\ expenditure}$

6.	Gas	It is expenditure made on gas divided by total expenditure of household *i*	$\frac{px_{gas}}{total\ expenditure}$
7.	Housing	It is expenditure made on housing divided by total expenditure of household *i*	$\frac{px_{housing}}{total\ expenditure}$
8.	Total expenditure	Expenditure made on food and non-food items of household *i*	$\sum(px_{food} + px_{non-food})$

Results and Discussion

Province and region-wise remittances receiving households in Pakistan (%)

Table 2 shows the results in terms of remittances receiving households by province. It confirms that Punjab has the highest percentage of remitted households (51%), followed by Khyber Pakhtunkhwa (41.1%), Sindh (3.3%), and Balochistan (1.4%). Furthermore, the 34.3% remittances receiving households belong to urban Punjab, followed by urban Khyber Pakhtunkhwa (20.5%), Sindh (2.7%), and Balochistan (1.2%). In terms of rural distribution, Khyber Pakhtunkhwa has 19.6% of remitted households, followed by Punjab (16.7%), Sindh and Balochistan have around the same. However, in all provinces, remitted households belong to the urban region, which is greater than the rural region. The argument could be made that a large portion of the population prefers to live in cities, which is the primary driving force behind the acquisition of technical skills, education, and other supportive amenities that are valued added to human capital to secure reasonable employment opportunities both nationally and overseas.

Table 2

Province and region-wise remittances receiving households in Pakistan (%)

	Region		
Province	***Rural***	***Urban***	***Total***
KP	***19.6%***	***24.5%***	***44.1%***
Punjab	***16.7%***	***34.3%***	***51.0%***
Sindh	***0.6%***	***2.7%***	***3.3%***
Balochistan	***0.5%***	***1.2%***	***1.6%***
Total	***37.3%***	***62.7%***	***100%***

Source: Author calculation based on PSLM 2014-15

Sources of Remittances (%)

Remittances are sent through both formal and informal channels. Formal remittances are payments made through official channels like banks and money transfer agencies, although informal channels like hundi, friends, and family, or monies taken home by migrants themselves, are also used. Table 3 shows that households who receive remittances from abroad through the formal route account for 36%. For remittances to their families, urban households use more formal banking channels than rural households, accounting for 64% of total banking channels. Despite having a better banking system, remittances received through an informal channel have a higher proportion of urban households than rural households. Remitted families receive 57% of remittances through Hundi in urban areas, compared to 43% in rural regions. It is critical to encourage new technology approaches in Pakistan's rural-urban areas, such as the Roshan Digital Account and internet facilities, in order to increase remittances sent through banks.

Table 3

Sources of Remittances received (%)

Region	*Remittances through Banks*	*Remittances through Hundi*
Rural	***36%***	***43%***
Urban	***64%***	***57%***
Total	***100%***	***100%***

Source: Author calculation based on PSLM 2014-15

Table 4 shows that 64.1% of remitted families in Punjab, 31% in Khyber Pakhtunkhwa, 3.7% in Sindh, and 1.2% in Balochistan get remittances through formal (bank) channel. In Punjab, 43.3% of urban remitted families obtain remittances through the bank channel, which is dominant, while in Khyber Pakhtunkhwa, the hundi channel is dominating (59.9%). Inaccessibility and unavailability of financial intermediaries could be used as a rationale for using the informal route. It's probable that the lack of a proper mechanism is linked to government policies that make it difficult for their human capital to send remittances to their loved ones. In Pakistan, however, the ratio of remittances coming through a formal channel is higher in urban areas than in rural areas. The recent government created Roshan Digital account for overseas Pakistanis, which provides quick access and availability of bank channels, as well as remittance-friendly policies. However, the data set used in this analysis has no information on recent changes in remittances sent via new electronic channels.

Table 4
Province and Region Wise source of Remittances

Province		*Region*		*Total*
		Rural	*Urban*	
Remittances received through bank	*KP*	*14.10%*	*16.90%*	*31.00%*
	Punjab	*20.80%*	*43.30%*	*64.10%*
	Sindh	*0.50%*	*3.20%*	*3.70%*
	Balochistan	*0.20%*	*1.00%*	*1.20%*
Remittances received through Hundi	*KP*	*38.80%*	*50.90%*	*89.70%*
	Punjab	*2.30%*	*3.10%*	*5.40%*
	Sindh	*0.80%*	*1.00%*	*1.80%*
	Balochistan	*1.30%*	*1.80%*	*3.10%*

Source: Author calculation based on PSLM 2014-15

Comparative Analysis Through Mean Difference test

Table 5 shows the mean difference test results for the following hypotheses: (1) there is no significant difference in mean budget allocation to food and (2) there is no significant difference in mean budget allocation to non-food items between remitted and non-remitted households in Pakistan. In terms of remitted household mean monthly budget allocation, it confirms that housing takes up much of the budget, with a mean monthly budget allocation of 0.467, followed by health (0.155), education (0.135), transportation (0.110), and food and other non-food items' budget share is less than 0.100. In terms of non-remitted household budget allocation, it indicates that housing is the most important category, with a share of 0.524, followed by transportation (0.142), education (0.130), and the remaining categories' share is less than 0.100. This research demonstrates that both remitted and non-remitted households devote a significant portion of their budget to housing. This confirms that as household income rises, so does the budget allocation for housing.

The t-test results are statistically significant, indicating the difference in mean monthly budget allocation to food and non-food items between remitted and non-remitted households. In the case of household budget allocation to food, the difference in mean monthly value is positive, indicating that remitted household budget allocation to food is more than non-remitted household. The positive value associated with the difference in mean monthly budget share to education demonstrates that remitted household budget's share to education is greater than non-remitted household. The difference in mean monthly budget share to health is positive and statistically significant, indicating that remitted household allocates more money to this category than non-remitting household. In the case of gas, the same effect holds true, as remitted household is allocating more money to gas than non-remitted household. The values of two-sample t-test for transportation, power, and housing is statistically significant, demonstrating that there exist differences in remitted and non-remitted budget shares. However, non-remitted household budget shares on these items are larger than remitted ones.

Table5

Two-Sample Mean difference t-test

	Mean Monthly Budget Allocation			
Groups	***Remitted households***	***Non-remitted households***	***Difference in mean monthly budget allocation***	***Two-sample t-statistics***
Food	***0.0987***	***0.0724***	***0.0263***	***15.380******
Education	***0.1357***	***0.1307***	***0.0050***	***1.415****
Health	***0.1552***	***0.0987***	***0.0565***	***18.648*****
Transport	***0.1101***	***0.1423***	***-0.0322***	***-12.07*****
Electricity	***0.0212***	***0.0258***	***-0.0046***	***-6.435****
Gas	***0.0116***	***0.0059***	***0.0057***	***7.536*****
Housing	***0.4674***	***0.5243***	***-0.0569***	***-11.904*****

Source: Author estimation based on PSLM 2014-15

Note: *shows significant at 10%, ** shows significant at 5%, and *** shows significant at 1%.

Conclusion and Recommendation

The main objective of this study is to investigate a comparative analysis of remitted and non-remitted households' budget allocation to food and non-food items for the case of Pakistan while using the PLSM 2014-15 dataset and the two-sample t-test. To fulfill this objective, the following hypotheses are tested: (i) there is no significant difference in mean monthly budget allocation to food and (ii) there is no significant difference in mean monthly budget allocation to non-food items between remitted and non-remitted households. In addition, distribution and sources of remittances receiving by province and region wises are estimated. Based on study's finding the relevant policy recommendations are as follows:

1. It indicates that by province and area, Punjab has the most remitted households while Balochistan has the least. In terms of rural areas, Khyber Pakhtunkhwa has the most remitted receiving households compared to other provinces' rural areas. To raise the proportion of remitted households, it is consequently more vital to boost job opportunities for rural and urban households both within and outside the country.
2. Since most remittances are received through the bank channel in Punjab, Hundi is used as a channel for remittances sent to households' members in Khyber Pakhtunkhwa. It is more necessary to promote Baking as a source of remittance sending in Punjab and Khyber Pakhtunkhwa. The present government of Pakistan has introduced a Roshan Digital account for Pakistanis living abroad, which gives quick access and availability, as well as a remittance-friendly option for remittances sending. This policy must be promoted with aiming to increase remittances through formal channel. In addition, new technological methods for sending remittances must be established in Pakistan's rural-urban areas.

3. Because the average monthly budget allocation to food, education, health, and gas is higher in remitted households than in non-remitted households. As a result, creating job opportunities for adult members of remitted households would be a viable policy option for increasing the budget allocation of remitted households to food and non-

food products. A similar argument is made for increasing non-remitted households' budget allocation.

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Online Distance Learning: A New Learning Approach in the Malaysian Gifted Education System

Rorlinda Yusof
Universiti Kebangsaan Malaysia, Bangi, Malaysia

Md Jais Ismail
College of Creative Arts, Universiti Teknologi MARA (UiTM), Shah Alam, Malaysia

Afifah Mohamad Radzi
Universiti Kebangsaan Malaysia, Bangi, Malaysia

While online distance learning has become more prevalent in Malaysia's higher education system, it is still uncommon in the country's secondary schools, particularly for gifted programmes. Following the spread of the COVID-19 pandemic, Malaysia's educational environment was transformed, resulting in the emergence of new prospects for successful distance learning. The purpose of this quantitative research was to determine whether online distance education benefits Malaysian gifted and talented students or not. The study comprised 305 students between the ages of 11 and 17 from a Malaysian gifted school. This research used a five-point Likert scale with a reliability coefficient of 0.94, which was determined to be reliable. After completing a four-week online distance learning course, participants were invited to complete a questionnaire. There were four learning areas in which effectiveness was assessed: learning facilities, assignments, motivation, and computer skills. While gifted students demonstrated a high degree of computer skill, the statistics indicate that online distance learning is moderately successful. Urban students showed a greater potential for online distance learning than rural students. More studies should be conducted on how to enhance online distance learning for gifted students .

Keywords: distance education; online learning; gifted and talented; COVID-19; survey research

The term "online distance learning" refers to the process of learning through text or virtual communication. Teachers and lecturers may utilise this method to connect with students throughout the nation in order to ensure the process of teaching and learning. This would assist students who are unable to study during normal school hours due to

Correspondence concerning this article should be addressed to Dr. Md Jais Ismail, Senior Lecturer Conservatory of Music, College of Creative Arts, Universiti Teknologi MARA Malaysia, Email: mdjais@uitm.edu.my

some reasons or who live very far to attend a class during regular school hours. The Universiti Sains Malaysia (USM) started providing a foreign higher education programme for Malaysians on January 1, 1971. This was a historical event in the Malaysian distance education system (Raghavan & Kumar, 2008). People had a lot to say about distance learning in the 1980s, when it was being contested in academia. Keegan (1980) has contributed to the development of distance learning terminology highlighting four definitions of distance learning accepted by the public. The concept of distance learning has been thoroughly discussed in the previous research includes:

I. Distance education that encompasses a wide range of educational programmes at all levels does not require students to be observed by a teacher all the time, nonetheless, it takes use of the organisation's planning, guiding, and instruction (Süğümlü, 2021).
II. Distance education's success is credited to its emphasis on actual implementation and basic structures, as well as its extensive use of digital media. The success of distance education is partly due to its capacity to deliver high-quality teaching resources that can be used to train a large number of students simultaneously from any location. As a teaching and learning strategy, it is unique (Bozkurt, 2019).
III. Distance education refers to teaching method whereby teaching is executed separately from learning behaviour, including side-by-side situations where communications between teachers and students are assisted with printed, electronic, mechanical, or other materials (Lee, 2020).

The concept of distance learning is also related to Holmberg et al., (2005) who defined distance education as a concept covering teaching and learning activities that are not conducted side-by-side in cognitive and/or psychomotor and affective domains for students and which provide organisational support. Such activities can be conducted anywhere and at any time, making it appealing to those with social and professional commitments.

The accessibility of a wide range of inventions with the potential to enhance teaching and learning quality in education has increased considerably over the past twenty years. Along with more established technologies such as printing, television, and radio, the following developing technologies offered chances to improve the quality of education: mp3s and video recordings, software training programmes, and digital (disc and TV). More recently, the growth of interactivity and connections through electronic networking networks, popularly known as the "Internet", has provided educational services to augment these technologies. Such innovations have been adopted by distance educators in large numbers, although their use in traditional on-campus education has been selective and extremely limited. Distance education, e-learning, and online learning also have similar expectations and views of the learning approach. Grant (2019) asserted that the application of new technologies to support online learning in the form of distance education can be extremely effective when meticulous consideration is given to students' attributes and the learning context. Therefore, online education learning has immense potential in this era of modern education (Bernard & Rubalcava, 2000).

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Problem Statement

In 2020, the world was shocked by the emergence and rapid spread of the Coronavirus pandemic (COVID-19). It was reported that COVID-19 has affected more than seven million people worldwide, costing more than four hundred thousand lives and affecting 216 countries (WHO, 2020). On 2 August 2021, the total case of COVID-19 had spiked up to 199 million cases. Malaysia has not been immune from the enormous impact of the disease. COVID-19, first discovered in December 2019 in Wuhan, China, was declared a pandemic by the WHO on 11 March 2020 (Mahase, 2020). In response, it proposed various prevention methods to prevent the further spread of COVID-19. In Malaysia, *Majlis Keselamatan Negara* (Malaysian National Security Council) implemented the Movement Control Order (MCO) starting from 18 March 2020. This resulted in the long-term closure of numerous sectors, including the education sector. Consequently, all kindergartens, schools, and universities were instructed to close. To ensure the continuance of education during the pandemic, innovative teaching and learning methods became highly crucial. However, online education pedagogy is not the same as educational pedagogy in the classroom and teachers require more time to master the requisite skills (Meyers, 2008). Moreover, school level education in Malaysia is focused on teaching and learning in traditional classrooms – which requires less application of information technology and online materials. According to Hamzah and Attan (2007), teachers' preparedness to use computer-based information technology in teaching and learning is only at an average level. Moreover, studies by Noh et al., (2013) found that the level of technological application during teaching activities is at a low level. Additionally, teachers' tendency to use technological innovation depends on their perceived computer self-efficacy. Nevertheless, Mohiddin and Khalid (2014) asserted that there has been an upgrade in teachers' knowledge of how to apply technology, although room for improvement remains.

From the perspective of students, Internet coverage has become the main constraint in the implementation of online teaching and learning, despite their motivation and willingness to commit to studying online (Zulkifli et al., 2020). Recent research during the MCO phase by Gong (2020) found that, other than the issue of Internet coverage for students in rural areas, most low-income parents have found it difficult to provide each of their children with digital devices. Consequently, the implementation of online teaching and learning has become a challenge for both teachers and students.

During this pandemic period, online distance education has also been utilised by gifted and talented students pursuing their studies at Pusat GENIUS@Pintar Negara, Universiti Kebangsaan Malaysia. Due to the unique system of gifted and talented learning that encourages self-education, accelerated learning, and a differentiated learning environment, online distance education has the potential to be widely implemented among these students. According to Risemberg and Zimmerman (1992), self-education by gifted and talented students is better than that taking place among average students. Duraku and Hoxha (2020) also agreed that online learning is more suitable to be applied on gifted and talented students than conventional learning.

In normal situations, gifted students attend face-to-face (physical) classes to learn a variety of subjects such as music, science, maths, language, and moral education (Ismail & Anuar, 2020). Since conventional learning is based on such an approach, it is important to conduct research examining online distance learning among gifted and talented students, given that the entire nation has been subjected to an MCO whereby face-to-face education is not allowed. Thus, a comprehensive design for gifted online education must be devised to include cognitive, affective, social, and aesthetic practices (Md Jais et al., 2018).

Research Objectives

The research objectives were as follows:

(i) To ascertain the extent to which online distance learning is useful for gifted and talented students.

(ii) To identify the effectiveness of online distance education with respect to learning facilities, assignments, motivation, and online class skills.

(iii) To compare the effectiveness of online distance education between students from urban and rural areas.

Conceptual Framework

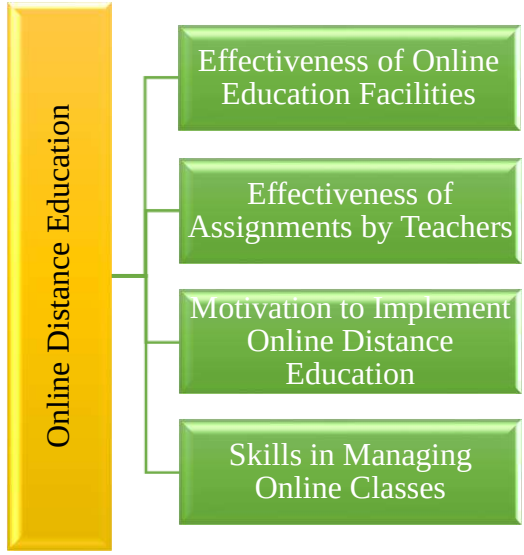

Figure 1: Conceptual Framework for the Effectiveness of Online Distance Education

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Online Distance Learning

Distance education refers to the formal learning activities that occur while students and teachers are physically or temporally separated. Television, videotapes, computers, email, and letter writing are all utilised to facilitate this kind of instruction. In online education, the Internet/World Wide Web (often referred to as the Web) serves as the major medium of communication and presentation (Demuyakor, 2020). Distance education also comprises instructions released concurrently, asynchronously, or both. Simultaneous courses require students and instructors to "meet" online at the same time to exchange information through audio or web conferences, scenarios, online discussions, interactive whiteboards, application sharing, instant messages, and texts. Asynchronous interaction can take place using all these methods, as well as through discussion boards, blogs, wikis, among others. The distinguishing feature is that students are not required to meet directly with their instructor or peers. Moreover, learning materials can be distributed through the Internet and across time zones. Distance education classes are always "open" with materials available for students – anytime, anywhere – that can be accessed without restrictions (Milman, 2015).

According to Bernstein and Turban (2018), current workplaces require individuals to invent and collaborate in the face of time and space constraints. This requirement has since paved the way for technological advancement that makes real-time communication between peers and colleagues possible via the Internet. This has also been applied in distance education. Modern devices help to create a stronger learning community whereby members can build expertise and expand problem-solving skills. As educators who are distance teachers and instructors strive to improve the quality of online courses, they encounter challenges in fulfilling the various requirements of populations that are more flexible and technologically experienced than previous generations. At the same time, 21st century students need an educational opportunity that is not restricted to time and space yet allows interactions with instructors and peers. Voice and video conferences, whiteboards, live presentation tools, application sharing, discussions, and emails are among the numerous tools available for interaction and collaboration (Ismail et al., 2021). Blogs, wikis, and podcasts, as well as social devices are emerging forms of technology that encourage connectivity among members of a group.

Bates (1991) asserts that there are two highly diverse forms of interactivity in learning: social and personal. Social interaction between students and instructors must be balanced with the interaction between each student and teaching resources, including textbooks, guides, audiotapes, videos, and computer-assisted learning programmes. He argues that the view that students in traditional institutions are primarily engaged in substantive person-to-person contact is a fallacy as "the vast amount of their studies for both traditional and distance students is undertaken alone, by far, engaging with textbooks and other learning mediums." Distance educators also understand the need for social contact opportunities to help learners succeed and have thus tried to replicate face-to-face communication by designing educational systems based on the forms of technology such as electronic conferencing, electronic communication systems, video conferencing, and computers. Social interaction that can facilitate efficient learning has been used by residential schools and regional tutors. It is important to note that the required balance between social and individual interactivity can differ from one course to

another, depending on the type of subject, specific course goals, structure, quality, and the target student audience.

Mukhtar et al., (2020) identified advantages and limitations of online learning for students. Among the advantages are improved access, increased learning efficiency, and preparation of successful students for the community through lifelong learning opportunities and experience. However, online study environments, such as the fund for online learning programmes, organisation plans, and student training may be limited. The benefits of incorporating online education into conventional classroom pedagogy to enhance face-to-face education were identified by Stone and Perumean-Chaney (2011). Teachers and instructors are the first to know what is "essential" to enhance understanding and learning among students. Firstly, teachers should logically and reliably plan and cascade resources so that they are better prepared to look for and solve problems and teach in a typical lesson setting. In addition, the strategy for allocating and clarifying student activities related to learning difficulties can be diversified. Teachers and students should also use emerging technologies for the production and delivery of teaching. Distance teaching also enables teachers to retain the course programme while exhibiting better pedagogical versatility and maintaining their relationship with all students. Stone and Perumean-Chaney also found that in the absence of instructors, students had greater access to course materials. This increases learning because repeat classes, including activities and problem solving, are accessible to students.

Anna (2013) conducted studies comparing the effectiveness of teaching methods between classroom and online learning. They assessed the extent to which online students succeeded compared with their peers who attended the faculty. They found that focusing during an online class environment may be more challenging than in the traditional classroom. However, the participation of fewer students may assist in improving the quality and quantity of interaction in the online class.

In addition to the advantages and importance of online learning, some of its challenges must be scrutinised, such as those listed by Puzziferro and Shelton (2009):

I. What can we do to make online learning more student-centred?
II. What are new evaluative steps required to assess participation, interaction, self-learning, and student control?
III. Are new learning theories required to drive us into the next generation of online learning? Do we apply the definition of quality only to the matters that we can measure?
IV. Is there any difference between physical and online learning?

Muilenburg and Berge (2005) conducted a factor analysis study to examine the constraints on students undertaking online classes. This study was undertaken using a large sample (n = 1,056) to determine the basic constructs covering these constraints. The eight factors found were administration issues, social interactions, academic skills, technical skills, students' motivation, study time and support, Internet cost and access, and technical issues. The independent variables that had a significance influence on students' evaluation of these factors were gender, age, ethnicity, types of learning

institution, self-evaluation of online learning skills, the effectiveness of online learning, enjoyment of online learning, prejudiced behaviour towards the traditional classroom, and the number of online courses completed.

In western countries, distance learning for gifted students has started since a decade ago (Adams & Cross, 1999). Gifted students are defined as those who possess high IQ level but having unique traits such as asynchronous development and overexcitability (Ismail et al., 2021). It is found that there is a variety of distance learning programmes conducted by mail, the Internet, or a combination of the two. Several colleges and universities provide programmes in mathematics, sciences, and humanities for gifted students. Adults with a natural talent for mathematics may benefit from the enrichment and challenge opportunities provided by the programmes, as well as answers to the challenges connected with a shortage of competent teachers in public schools who can teach higher-level courses at the secondary level. Many colleges and organisations provide free or reduced-cost enrolment possibilities to gifted high school students interested in participating in their online learning programmes (Threlkeld, 1991). However, several nations, such as Malaysia, have yet to include online distance learning into their gifted education programmes. The Malaysian gifted school has created its first online distance learning programme in response to the COVID-19 outbreak, which began in 2020. According to Md Jais et al. (2020), Malaysia's educational system is shifting away from conventional modes of teaching to a more comprehensive style of instruction via the usage of online distance learning. This research is being conducted to determine the efficacy of a certain kind of online instructions for Malaysian gifted children in general.

Method

Research Design

This quantitative study employed a survey research design where respondents were exposed to a research intervention, and they then answered a questionnaire at the end of the intervention. According to Ponto (2015), survey research is conducted with a group of individuals to get information through questionnaires. Purposive sampling was applied to recruit potential respondents. The elements of learning effectiveness encompassed four domains: learning facilities, assignments, motivation, and online class skills.

Sample

This survey research was applied on gifted students recruited through simple random sampling method. The respondents were students from Pusat GENIUS@Pintar Negara, Universiti Kebangsaan Malaysia who met the criteria for gifted and talented students as developed by Md Jais and Azu (2020) in that they were more matured compared to their peers and possessed an IQ level greater than 130. The research population consisted of 465 gifted students from Foundation 1 to Level 2 between the ages of 11 and 17, comprising 231 male (49.7%) and 234 female (50.3%) students. These are students who passed the gifted screening tests (IQ testing) in Malaysia education system known as UKM1, UKM2, and UKM3. From this population, the research sample was selected. This involved 305 gifted and talented students – 138 male (45.2%) and 167

female (54.8%) – of whom 202 were from urban areas (66.2%) and 103 from rural areas (33.7 %). Based on the proposal of Krejcie and Morgan (1970), this sample size is parallel to the population size and is suitable for research purposes.

Instruments

Data were collected using a questionnaire comprising 21 items that measured the four effectiveness domains as follows: learning facilities (5 items), assignments (7 items), motivation (5 items), and online class skills (4 items). Responses were made on a five-point Likert scale (1: Strongly Disagree, 2: Disagree, 3: Quite Agree, 4: Agree, 5: Strongly Agree). The questionnaire was developed through mapping the instruments employed in studies by Norasyikin and Mohd Isa (2017) and Tuntirojanawong (2013). A pilot study was conducted with 96 students indicated that the reliability of the instrument was high ($\alpha = 0.94$), as suggested by Sekaran and Bougie (2013). The distribution of items according to subscale is presented in Table 1.

Table 1

Item Distribution of the Effectiveness of Online Distance Education

Subscale	Item Number	Total Item
Facilities	C1,C2,C3,C4,C5	5
Assignment	C6,C7,C8,C9,C10,C11,C12	7
Motivation	C13,C14,C15,C16.C17	5
Online Class Skills	C18,C19,C20,C21	4

Procedure

Gifted students were exposed to online distance learning for a period of four weeks. During this time, they learnt subjects such as Mathematics, Biology, Chemistry, English, Islamic Education, Music Education, and Physical Education through virtual platforms like Google Meet, Zoom, Google Classroom, WhatsApp, Telegram, and YouTube. All assignments were submitted through Google Classroom. Students were provided with a class timetable and they had to attend every subject for 1 hour using a computer or a smartphone. Sample of timetable is shown in Figure 2.

	08:00 - 08:30	08:30 - 09:30	10:00 - 11:00	11:30 - 12:30	12:30 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00
Mo	HR	PHY	MATH	PAI	B	BHS+	IC CHEM	IS
Tu	HR	BIO	CHEM	ENG	B	IC +MATH	IC PHY	IS
We	HR	PJK	+MATH	V.ART	B	SD	KOKO (P)	IS
Th	HR	KOKO (S)	BM	MUSIC	B	IC BIO	IC MATH	IS
Fr	HR	SC	SEJ	RSCH	BREAK		MORAL	IS

Figure 2. Sample of Timetable for Online Distance Learning

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The summary of learning activities for each subject is shown in Table 2.

Table 2
Summary of Four Weeks Online Distance Learning Activities

Subjects	Topics	Activities
Mathematics Foundation 1	Introduction to Algebra	1. Pre-test: online short quiz using Quizizz. 2. Complete a Riddle in pair about the basic concept of Algebra. 3. Flipped Classroom: example and video on application of Algebraic Expression and Equation. 4. In a group of three, students carry out problem-based learning and prepare a poster presentation. 5. Individual assignment to solve Algebra equation.
Biology Foundation 3	Movement of Substances Across Membrane Plasma	1. Flipped Classroom: reading materials and video 2. Presentation during online session using Google Meet. 3. Online quiz using Quizizz. 4. Written task/essay submitted via Google Classroom. 5. Group assignment to prepare a digital membrane plasma and video presentation.
Chemistry Level 1	Chemical Formulae and Equation	1. Small group discussions using breakout room in Zoom. 2. Presentation of the results through small group discussions during class. 3. Online quiz using Google Form as individual assignment. 4. Assignment is submitted through Google Classroom.
English Foundation 2	Reading Writing Listening Speaking	1. Presentation using Canva and PowToon via Google Meet. 2. Discussion via breakout room in Zoom. 3. Online quizzes via Quizizz and Kahoot! through Telegram. 4. Watch videos in Zoom on certain topics and write reflection. 5. Watch movies on YouTube and write movie reviews. 6. Analyse online research articles through Google Scholars. 7. Notes and exercises uploaded on Google Classroom.

		8. Individual assignment to answer quiz through Google Form.
Islamic Education Level 2	Hajj and Umrah	1. Watched a video on real Hajj at Mecca on Google Meet. 2. List *rukun* Hajj using Padlet. 3. Create a video on Hajj demo. 4. Individual assignment to compare Hajj and Umrah and submit through Google Classroom.
Music Education Foundation 1	Malaysian Music History-Traditional Music	1. Power Point presentation using Google Meet. 2. Watch Malaysian Traditional Music on YouTube via https://youtu.be/izRi0np91D4 3. Read notes from websites at https://www.roots.gov.sg/ich-landing/ich/traditional-malay-music 4. Analysis of research articles related to Malaysian traditional music in Google Scholars. 5. Online quiz using Kahoot and Google Form. 6. Create a Malaysian traditional video performance and submit through Google Classroom. 7. Discussion session through Google Meet and WhatsApp group.
Physical Education Level 2		1. Video presentation by teacher and discussion through Google Meet. 2. Online quiz using Wordwall. 3. Video making related to Force and Motion Experiment from situation given. 4. Mind mapping activity using Canva.

Results

As indicated in Figure 3, 90 per cent of students were able to manage online classes using digital platforms such as Google Classroom, Quizizz, Kahoot, and Google Form. A total of 84 per cent were able to complete online assignments assigned by lecturers according to a flexible timetable, ease of reference, and convenience in submitting as well as receiving assignments. In overall, 77 per cent of students possessed online learning facilities such as a stable Internet connection, laptop, computer, and smartphone. However, only 56 per cent were motivated to learn online which means they were being confident, self-affirmative, interested, and experiencing less emotional stress during online learning sessions.

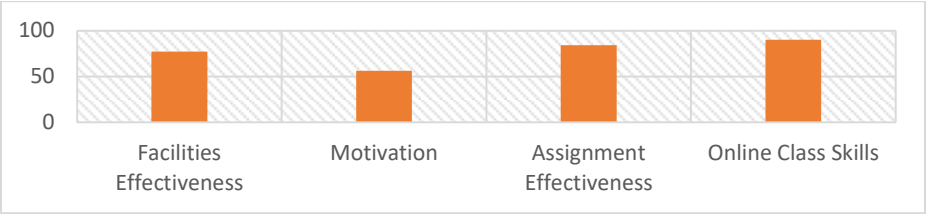

Figure 3: The Implementation of Online Distance Learning

As demonstrated by the mean score interpretations in Table 3 and mean values in Figure 4, students were able to manage online classes at a high level with a mean of 3.95. They were able to conduct online learning using digital facilities, complete online assignments, and have a level of motivation at medium levels of 3.51, 3.54, and 2.63, respectively. In general, the effectiveness of online learning is at a medium level with an overall mean score of 3.41.

Table 3

Mean Score Interpretation (Mohd Majid, 1990)

Score	Interpretation
1.00 – 2.33	Low
2.34 – 3.66	Medium
3.67 – 5.00	High

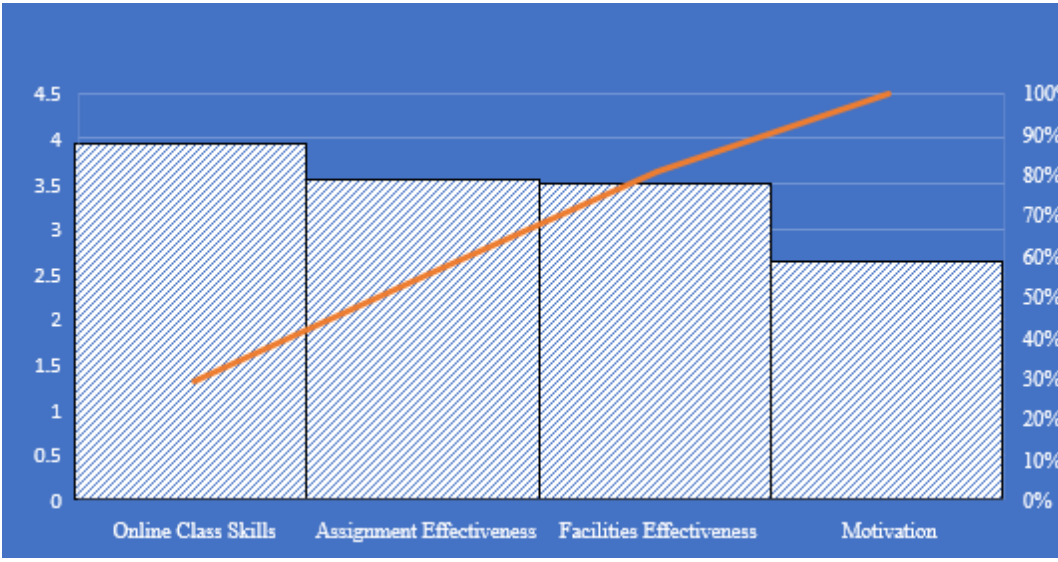

Figure 4: Mean values of Online Distance Learning

Comparison of Online Distance Learning between Gifted and Talented Students from Urban and Rural Areas

As indicated in Figure 5, students from urban areas scored means of 3.65 for learning facilities, 3.57 for the ability to complete assignments, 2.66 for motivation when conducting online learning, and 4.04 for online class skills. This suggests that students who live in urban areas possess high online class skills and medium level scores in other domains. By comparison, students from rural areas scored means of 3.24 for learning facilities, 3.48 for the ability to complete assignments, 2.57 for motivation to conduct online learning, and 3.77 for online class skills. This shows that students who live in rural areas also have high online class skills and medium level scores in other domains.

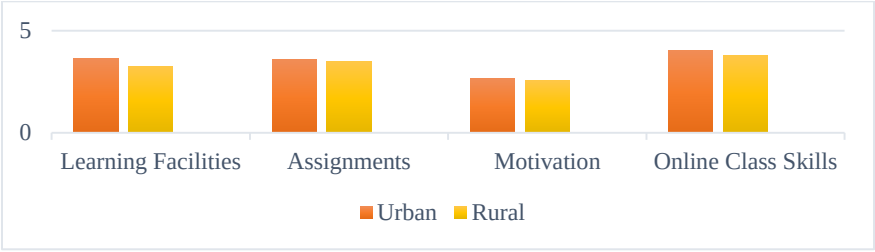

Figure 5: Comparison of Online Distance Learning between Gifted and Talented Students from Urban and Rural Areas

As presented in Table 4, the T-test result suggests a significant difference in online learning between students from urban and rural areas. Specifically, the scores of students from urban areas were higher in regard to learning facilities and online class skills ($\alpha < 0.05$). This suggests that students from urban areas have better learning facilities and higher skills compared to students from rural areas. However, no significant difference between students from urban and rural areas was found with respect to completing online assignments and motivation ($\alpha > 0.05$).

Table 4
Comparison of Learning Effectiveness Using a T-test

Variables	N	Mean	T-value	df	Sig.(2-tailed)
Learning Facilities	305		4.7	303	0.00
Assignments	305		1	303	0.31
Motivation	305		0.72	303	0.48
Online Class Skills	305		2.68	303	0.01

Discussion

The findings of this study indicate that learners' perception of online learning during the COVID-19 pandemic is positive. It demonstrates that gifted students perceived online learning to be extremely useful during this period. Students, as mentioned by Popovici and Mironov (2014), have shown a keen awareness of the variations brought by the digital technology and their influence on students' learning experiences. On the other hand, the findings contradict Keller and Cernerud (2002), who demonstrated that students

did not see e-learning as an advantage. Male students with high computer skill were shown to be less optimistic about e-learning in school than those with a favourable attitude towards new technologies. The current study does not only indicate that online learning is effective amid the COVID-19 pandemic but also elucidates the availability of Internet access, task efficiency, student motivation, and online learning skills.

Regarding ICT facilities, we suggest that schools should use social media applications such as WhatsApp and Telegram to make it easier for students to access online classes and tasks. This supports the findings of Mamattah (2016) where most respondents consider it costly to purchase digital gadgets for distance learning rather than face-to-face learning. In terms of the availability of assignments, individual tasks are perhaps better suited to maintaining the physical distance due to the pandemic, while group tasks can be undertaken to help friends who do not have digital tools and Internet access. With respect to students' skills, the findings are consistent with those of Mislinawati and Nurmasyitah (2018) who found students' knowledge of ICT in their everyday lives played an important role in their knowledge of online learning. While operating online, the materials and assignments must be well understood by students and preceded by a clear explanation. The results thus suggest that the materials and instructions used by the teacher in online learning were easy to understand.

In addition, online distance learning seems to be a proper learning method for gifted students. From the findings, it shows that gifted students from both urban and rural areas have the skills and motivation to participate in online learning. Although gifted students from rural areas face some issues related to facilities, it does not diminish their interest in taking part in online distance learning. Importantly, when students are interested to attend a class, they will enjoy the lesson and boost up their achievement (Khan et al., 2021; Hinduja et al., 2020). Therefore, by implementing online learning, gifted students in urban and rural areas may learn and perform well in both academic and non-academic fields. Not only that, they also show intense concentration and dedication to studying, and always seek opportunities to ask questions. The present study also indicates that gifted students understand what is being taught through online distance learning as they show positive feedback and are able to complete all the online assignments.

The distribution of technology (Google Classroom, Quizizz, Kahoot, and Google Form) literally bundles knowledge and instruction to give students access to educational experience. However, what really matters is the quality of the instructional message, rather than any inherent characteristics of the medium employed. Clarke (1983, as cited in Taylor, 1995) stressed that educational technologies are "pure vehicles that educate but don't affect student achievement any more than the truck that delivers our groceries causes changes in our nutrition". This indicates a need to distinguish clearly between the medium and the message. It is fully possible for a teacher to be accompanied by a team of audio-visual technicians, graphic designers, and computers to modify the way they convey the instructional message without dramatically increasing pedagogical effectiveness. Before claiming to be an expert in a certain subject, it is vital to do a comprehensive assessment of one's own knowledge and cognitive ability. Numerous

approaches, including cognitive analysis, novex analysis, and idea mapping, are utilised to create a collection of well-designed teaching and learning experiences that dramatically improve the quality of gifted teaching and learning experiences (Maker & Pease, 2021; Taylor, 1994; Ryder & Redding, 1993). This reflects a transition from the situation of a single teacher (often without formal technical training in education) to a multi-disciplinary team that applies a wide spectrum of specialist experience and who are responsible for planning, implementing, executing, and reviewing education programmes.

Based on the findings, it is found that gifted students prefer to adapt online distance learning compared to other students in mainstream schools. Tomlinson (2000) defined differentiation as customising instructions to fulfil students' individual needs and such differentiation can be categorised into four elements namely content, process, products and learning environment. Gifted and talented students at Pusat GENIUS@Pintar Negara have been exposed to Differentiated Instruction (DI) in both physical and virtual classrooms. As such, online distance learning works effectively on gifted and talented students because they are allowed to explore the lessons according to their needs. In addition, National Association of Gifted Children (2013) confirmed that gifted students are those "*exhibiting outstanding intellect, ability, or creative talent*" and having "*persistent intellectual curiosity*". This in a way suggests that gifted students with high ability, creativity and curiosity mostly find online distance learning tolerable and manageable. Unlike gifted students, a case study by Basar et al., (2021) proved that non-gifted or average students are less motivated when the learning has to be done virtually and they view conventional or face-to-face learning as more significant.

Through this study, we realise that there are advantages of distance learning for gifted learners. The flexibility of distance learning provides chances to gifted students to work on assignments from home, and students may work more autonomously than in the classroom. When education can be offered at the time and location where it is required, costs are decreased, and students may easily connect to other students as they become more linked to one another. There are several chances for gifted students to obtain materials in a short time and this allows them to communicate with other individuals from all around the globe. It provides students with the opportunity to interact with other students who share their interests in academics. Moreover, distance learning permits gifted students to interact with each other in a unique manner. Through virtual environment, gifted students may learn about different countries and cultures from their own homes. Rural gifted students may be exposed to cutting-edge computer technology while learning about telecommunications via distance education. It is possible for students to learn about occupations, school courses, and role models that they wouldn't have otherwise been exposed to. With the ease and cost-effectiveness of distance education, both school and students get the benefits.

Conclusion

While there are numerous learning strategies for gifted and talented students (Md Jais et al., 2021; Ismail et al., 2020; Kamis et al., 2018), the current researchers conclude that the only successful method of learning during the MCO due to the COVID-

19 pandemic has been through online distance learning. Although research findings indicate that its effectiveness is low, the researchers are persuaded that if the approach can be improved with a more careful preparation, this will enhance the quality and effectiveness of online distance learning. Results in the present study show a significant difference in online learning between students from urban and rural areas. Specifically, the scores of students from urban areas are higher in learning facilities and online class skills while students from rural areas have lack of learning facilities and skills. It is recommended to the government and school officials to closely monitor rural gifted students and provide facilities for them. An allocation from the national budget for instance could be channelled to rural schools and students to make online distance learning happen and successful. Community and parents can also play their roles to ensure all students are well catered and equipped with necessary learning materials to implement online distance learning. The findings from other studies signify that online distance learning methods are applied in different countries in accordance with their cultural perspectives and arrangements. Nonetheless, in critical times such as these, education using virtual platforms with high-tech learning facilities is essential. While it remains to be seen whether this is relevant to post-COVID-19 e-learning, it is one of the few places where innovation has not ceased. The importance of disseminating information across continents, industries, and all aspects of society has been made clear by this pandemic. It is incumbent upon all gifted practitioners to explore the full potential of online learning technology. Thus, we propose potential research priorities to cover developments in the gifted education system with respect to distance learning, implementation of high-tech learning facilities (especially for rural students), as well as an assessment of distance education in the gifted and talented education sector.

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Effects of Clusters and Business Environment Context on Knowledge Absorption Capacity and Measurement with A Panel Analysis

Durmus Cagri Yildirim and Korhan Arun
Namık Kemal Mahallesi Kampüs, University, Süleymanpaşa, Turkey

The theoretical hypotheses of absorptive capacity (AC) are relatively simple; validation and measurement are more complicated. There are still discussions about AC's best proxy or measurement because archival or survey methods may not provide dependable results. Additionally, absorption theories have not researched the effectiveness of a spatial or geographically relevant bounding as a cluster. Exterior factors define absorptive capacities, but their contingent effects on variables and forms are unclear. Limited studies on the external networks and business environment and change in theory versus execution remain essential research subjects. This research aims to explore the effects of clusters and the business environment on absorptive capacity from the perspective of contingency theory. Based on a sample of 38 nations, World Bank, and Global Innovation Index within the 2013-2018 period data, panel analysis shows that cluster inclusion and business environment relative to the nation can strengthen the absorptive capacity. The results also show that the proxy variable of absorptive capacity is significantly related to results.

***Keywords*:** Absorptive capacity, Clusters, Business Environment, Panel Data Analysis.
Jel Codes: D83, I.14, Q51, C23

Firms need external knowledge to be innovative. However, external knowledge is different from know-how. Moreover, there are various knowledge resources and an infinite amount of external knowledge. So, it is hard to search and detect practical knowledge from outside the firm. Another aspect of practical knowledge is the degree of absorption in the firms. Firms can not decide whether the knowledge is helpful unless external adaptation turns to internal integration or absorption. Exploitation and commercialization, building external knowledge, and pursuing business-driven knowledge are affected by various reasons. Thus, it is still important to study the key factors that affect these reasons. Clusters are one form of knowledge resource, and the business environment is relevant to quantifying the knowledge. Hence, this paper researches the operationalization of absorptive capacity (AC) using an instrument to

Correspondence concerning this article should be addressed to Dr. Korhan Arun, Associate Professor, Namık Kemal Mahallesi Kampüs Cd. No:1 Süleymanpaşa /TEKİRDAG/TURKEY, Email: karun@nku.edu.tr

obtain scores from variables related to collaborating ways with external partners because AC is a collaborative, inter-organizational endeavor.

The Problem of External Knowledge Absorption for organizations is absorption process from external networks can be working on fundamentally different terms (Williander, 2007). Although the concept of AC is related to the environment response (Arun & Yıldırım, 2017; Rojo et al., 2016), previous articles studying the relationship between the environment and AC are limited (Kim et al., 2013). Both formal and informal modes of advanced interaction with external knowledge resources have been built on the critical blocks of most industrial innovation without seriously understanding how. So, in the literature, the real impact of national contexts at the organizational level of AC is still unclear (Gaur et al., 2019).

Moreover, the literature has not considered the systematic casual effects of underlying mechanisms and research on absorbent capacity between firms, especially from the macro inter-organizational level perspective (Newey & Verreynne, 2011; Van Wijk et al., 2007). AC is not static, but it is a process or ability that AC should be researched within the non-R&D contexts to understand its various dimensions' complexities (Lane et al., 2006). That is why the business environment and markets are important contexts that may affect AC directly. The expression of the related companies may well be operating in different but complementary activities is misleading. Many organizations partly belong to different markets or business environments (Hamdouch, 2010) or are distributed spatially unevenly (Jiří et al., 2017). How organizations can harness the value of new external information and process it through outcomes may seem like an important research topic of absorptive capacity theory (Butler & Ferlie, 2019; Cohen & Levinthal, 1990; Pi et al., 2018). However, measuring absorptive capacity and defining proxy variables are difficult but studying the innovation and absorptive capacity relationships is more problematic because of the heterogeneity of the external context. In common, R&D and/or human capital measurements are used for measuring AC proxies (Cassiman & Veugelers, 2006; Harris & Yan, 2019; Moilanen et al., 2014; Spanos & Voudouris, 2009) even though neither measurement can be fully indicator of its designator (Flatten et al., 2011; Lane et al., 2006) especially when measuring at the macro level. This paper attempts to identify some of the measurement variables and effectiveness of absorptive capacity, focusing on the relationships between environment, networks, and country context.

Absorbing the new external knowledge depends on the recipient and the process of knowledge transfer between the organization and its environment (Zhao & Anand, 2009; Li et al., 2014; Reiche, 2011). Absorptive capacity depends on multidimensional facets and has different subsets. As a source of absorptive capacity, organizations have

exterior, process, and individual levels (Matusik & Heeley, 2005; Zou et al., 2019). Beating around the bush, absorption capacity researchers tried to measure recognizing the value of new exterior knowledge without considering the conditions of the external environment (Bradford & Saad, 2014). At the macro-organizational level, one of these dimensions of assimilating knowledge is based on dyad characteristics or networks. Absorbing and transferring knowledge have been built by maintaining a diversity of network ties (Tepic et al., 2012), in which organizations' capacity to receive external knowledge (Kang & Kang, 2014; Zahra & George, 2002). In other words, organizations need to know where the sources of information are.

Matusik and Heeley (2005) related the external environment to high network relations. Infrastructure, services, and management optimization can only be achieved after a certain level of clustering, leading to technological progress and human capital improvement. Some of these developed clusters rely on their advantages along with the horizontal adsorption of the surrounding region (Liu, 2010). Clusters thus appear as a source of superficial knowledge depending on relations in the equivalent cognitive environments between organizations at the interchangeable location and other distant organizations (Giuliani et al., 2019). However, from an economics perspective, the knowledge flow is regional-specific and related to the spatial level of correlations (Li et al., 2020). The manufacturing and export numbers will decrease in the West because of the competition from the East. So, to understand the relationships between organizations and the environment, we need to analyze the conditions and particular directions in the environment and do an inter-organizational network relation in developed countries (Goes & Park, 1997; Hatch & Cunliffe, 2013).

As cluster theory reflects the big picture, connected entities in the relationships can differ surprisingly (Latour, 2005). The extent of joint development supports an inverted U-shaped impact on performance and absorption (Pi et al., 2018). Here, there are strong institutional and inter-organizational links between interdependent actors that define the value of the network. However, the links envisaged are only formal but informal interactions between organizational or state factors (Hamdouch, 2010). Absorption in the clusters also depends on how organizations are aligned with local environmental conditions given the context of the public business environment occurring at the business level. The environment in which the cluster is embedded affects the contextual conditions of an industrial cluster emphasize (Mueller & Jungwirth, 2016). The business environment employs 'ease of starting a business and 'ease of closing a business' (Cost of redundancy dismissal) (Gannon & Pillai, 2013; Yadav & Chaudhari, 2018). Consequently, these factors, which have never been researched quantitatively at macro levels, are significantly related to clustering effectiveness and absorptive capacity as a natural result.

Although highly-developed clusters have been attracted attention recently, no quantitative papers have studied clusters from an international perspective as whole or consequences from an absorptive capacity perspective. (Mueller & Jungwirth, 2016). The effectiveness of industrial clusters, including knowledge flow, depends on the clusters' context, structure, and functioning mechanisms, e.g., funding authorities' ease of starting a business. Developments in the spheres of culture and business can partly be understood in terms of arguments that are essentially variations of the notion of the clusters. Even though many researchers have studied AC as an important concept and have been cited in numerous research in related fields, they do not have a standard conceptualization and measurement method (Pi et al., 2018). So, in this paper, the main research question is to find out the effects of cost of redundancy dismissal, ease of starting a business, and cluster development variables on knowledge absorption of organizations with macro quantitative analysis. Staying on the ball, specifically, we examined three dimensions that comprise the absorptive capacity construct: (a) measurement of knowledge spillovers with a new variable set at the national level of these variables related to each nation, (b) cluster approach to external knowledge, and (c) business environment accordingly with the nation.

Another reason why it is valuable to look at a country comparison between developed economies is that there could be a difference in theory versus what occurs on the ground in these countries.

Clusters and Absorptive Capacity

A firm's absorptive capacity is positively related to its knowledge (Zou et al., 2018). However, this transfer depends on market and industry sources (e.g., industry, other competitors, and suppliers)(Murovec & Prodan, 2009), density, and diversity of relations (Moreira et al., 2018), or coordination (Moreira et al., 2018). Relation to these factors needs a network of indirect interaction such that most of its members are interlinked, at least through a third party, who is also one of the most critical aspects of clusters (Sedita et al., 2020). Additionally, the primary function of AC is seeking and identifying valuable external knowledge, absorptive effort (Todorova & Durisin, 2007), which concerns a knowledge-building portfolio that enables the organization to search, identify, and acquire external knowledge (Arun & Kahraman Gedik, 2020; Song et al., 2018). Especially, small and medium-sized enterprises SMEs need knowledge networks or clusters for innovation (Rodríguez et al., 2020). Naturally, clusters ease the knowledge spillovers to diffuse in space more effectively because clusters increase the firm knowledge base. The knowledge base is vital in the absorptive effort, so in AC, development is cumulative and path-dependent related to clustering characteristics. The main idea behind the cluster formation is that valuable knowledge would become like public good for the income of the organizations. In other words, knowledge spillovers, intellectual capital, input sharing as proxies can be helpful to explain the success of organizations in clusters (Chain et al., 2019). However, absorbing maximum knowledge

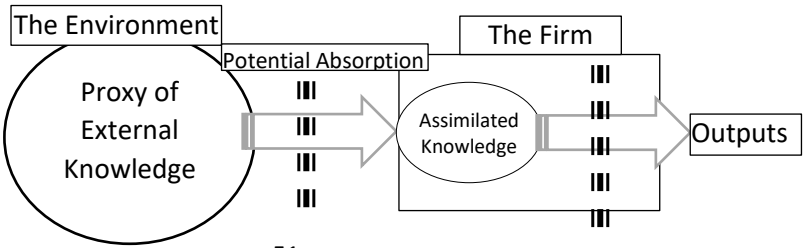
in collaborative networks is still related to the collaboration exchange process between partners (Movahedian-Attar, 2016).

Consequently, firms get unequal advantages from being located in a cluster, but even if it is generally related to homogeneity between firms located within clusters, whether firms can gain or lose from the co-location in similar industries depends on a variable like ACs (Grashof et al., 2020; Šarić, 2012). Aoki and Takizawa (2002) showed that if organizations are seeking technical advantage and willing to absorb dominant technological developments, they will seek to connect over the network involved during the production under this system. However, the opposite idea also asserted that knowledge transfer within firms is more critical than inter-firm relations (van Wijk et al., 2008).

Even though some researchers explained cluster and absorptive capacity relations, they explained the value-adding process and positive factors or namely network dynamics in clusters that affects knowledge absorption (Belso-Martínez et al., 2016; Bocquet & Mothe, 2010; Chandrashekar & Mungila Hillemane, 2018; Grandinetti, 2016; Pan et al., 2019; Pérez Hernández et al., 2017). Network dynamics depend on firms' relational capability, which positively impacts the AC because the firms' network has an important factor in accessing external knowledge and gaining exterior support to strengthen the AC (Zou et al., 2018). Supporting these authors, Ganesan et al. (2005) found that the absorption typically ascribed to close geographical proximity may be attributed to strong relational ties. In other words, even if the firms benefit from geographical closeness, they need the benefits of cluster membership.

Zahra and George (2002) divided the absorption process into two subprocesses. Potential absorptive capacity includes knowledge acquisition, which mainly focuses on knowledge exploration from the environment (Fig 1) (Zou, Guo, & Guo, 2019). Acquisition refers to "a firm's capability to identify relevant external information over the total amount of information surrounding the firm" (Du et al., 2015). However, later some authors argued a four-factor model in which acquisition, assimilation, transformation, and exploitation are separate dimensions. They had a better capture knowledge absorption capacity (Flatten et al., 2011; Jansen et al., 2005).

Figure 1: From external knowledge to outcomes (Fosfuri & Tribo, 2008)



International ecosystems have a more competitive environment than the regional or national cluster (Rinkinen & Harmaakorpi, 2018). In an international, rather than regional or small, ecosystem, the accumulation of knowledge-knowledge absorption- is critical to cluster formation (Botelho & Bastos, 2010). From the organization's viewpoint, organizations absorb knowledge from the environment to produce output (Hatch & Cunliffe, 2013). Nevertheless, since such studies often use citations to measure knowledge transfer or the type of innovation pursued, using non-survey data is confusing at the organizational level (Van Wijk et al., 2007) to measure knowledge absorption relations. So, metadata should be referred to as measuring absorption at the spatial scale in that paper.

Measuring absorption function at the level of spatial units instead of at the level of organizations is helpful to measure and analyze geographic pathways of knowledge spillovers. Because knowledge absorption at a larger scale differs from regional scales, absorption is different in the targeting industry. However, network relations are important (Kuchiki & Tsuji, 2010). Thus, we can better understand the outcomes and effectiveness of public and private R&D expenditures on the organizations' innovative performance in each spatial unit considered. Antecedents of the inter-organizational knowledge transfer comprise the knowledge and organizational characteristics, network characteristics (Van Wijk et al., 2007), cultural and business context (Maldonado et al., 2019). Additionally, not individual or organizational, but the knowledge base of the cluster will affect the AC process of the organizations located in the cluster (Solano et al., 2020). From that point of view, the field of ordinary experience, formed by cluster members, is more critical than intra-organizational procedures. So, being in the cluster makes more sense than assimilating knowledge within organizations.

Organizations can benefit from a sizeable external knowledge range and specific knowledge that enhances their competitiveness and innovativeness by being in a cluster and facing negative effects. Companies in a cluster face stronger competition because companies in the same cluster have similar access to resources and markets. So, companies seek to differentiate and create distance in production and market from other companies in the clusters (Ferras-Hernandez & Nylund, 2019). Clusters positively affect organizational productivity and supply, but net returns have a reverse U shape (Duranton et al., 2010). Shi et al. (2019) found that there is a "nonlinear (curvilinear) relationship" between networks and innovation in technology-intensive industries. These authors found that "*too many external search channels and as well deeply relationships cannot improve even worsen innovation outcomes because of increasing exterior search costs and the potential danger of leakage key technologies*".

CLUSTERS AND BUSINESS ENVIRONMENT

At the country level, R&D investment positively increases innovation. Clusters are conducive environments or contexts (Gotz, 2019), distant knowledge sourcing is related to AC (Grashof et al., 2020). Supporting that view, Belso-Martínez et al. (2018) found that multinational organizations set up new subsidiaries in other clusters to benefit from extra-cluster knowledge, especially in intellectual capital. As a result, transnational organizations see clusters as national or multinational context bases rather than specified proximity. So, simultaneous measuring methods and variables for distant knowledge transfer with focused spatial effects are needed. Although hypotheses for measurement ACs are relatively simple, their measurement empirically is more complex. There is no longer a well-defined relationship between R&D and innovation; these relationships are moderated by dimensionality, proxy choice, use of the survey versus archival data, and the cultural and industry context of the study (Maldonado et al., 2019). Some firms, most often the small and medium-sized ones, maybe highly innovative despite the low R&D spending and levels.

On the other hand, organizational clusters and individuals collaborate and reciprocally interact to generate innovation (Liu et al., 2018). Consequently, measuring the effects of being a cluster member from a macro perspective is necessary for knowledge absorptive capacity theory. According to explanations, hypothesis 1 can be interpreted as:

H1: Being a cluster member positively increases the knowledge absorption capacity.

Even if broader external knowledge search increases AC (Koski & Svento, 2016) and interfirm knowledge flow exists in all types (Wu et al., 2020), external sources or search channels that firms rely upon are sparse and fragmented (Shi et al., 2019). Consequently, these heterogeneous collaboration networks and knowledge network resources negatively affect AC (Ardito & Messeni Petruzzelli, 2017; Zou et al., 2019) because of the quantity of knowledge available to absorb and exploit in these diverse contexts is also heterogeneous. Heterogeneity makes it difficult and increases the costs involved in absorbing new knowledge (Miles, 2012). From that point of view, clusters can improve the efficiency of knowledge flow and AC (Scherrer & Deflorin, 2017). However, the network dimension attributable to clusters stresses the importance of social networks and external knowledge sources, which contribute to developing the capabilities (García-Lillo et al., 2018). As a natural result, firm relational networks become more heterogeneous and distinctive; thus, accessing specific and unique opportunities and barriers is not just the cluster but business environment-related (Elche et al., 2018). Additionally, one of the significant differences between the clusters is navigating bureaucracy, including the ease of starting a business (Gannon & Pillai, 2013).

Cost of Redundancy Dismissal and Ease of Starting A Business and Absorption Capacity

Modern organization researchers and theorists have tried to define and analyze organization–environment relations on the conditions' dimensions and trends within environmental sectors (Hatch & Cunliffe, 2013). Based on the contingency theory approach, also factors may affect absorptive capacity. The contingency theory argues that the performance of firms, absorptive capacity in this paper, is related to the alignment between contingency factors such as size environmental factors (Donaldson, 2001; Ghofar & Islam, 2015). Consequently, when absorptive capacity researchers should define the external environment, they should consider the conditions and constraints in these environments relative to the country.

The ease of starting a business is vital to firms' innovation (Dreher & Gassebner, 2013). Furthermore, innovation is consequential to absorption capacity (Xie et al., 2018). In that sense, it can be a refreshing idea to research the relations between these two factors. The Doing Business Report, published annually by the World Bank, has been ranking the business environment of almost 200 countries worldwide (Doing Business, 2020). Business creation is related to absorption capacity (Gray, 2006). However, business creation is not homogenous globally. So, even if the absorption capacities can be the same different environmental factors in the national context can be significantly related to absorption capacity.

H2: Ease of Starting a Business positively increases the absorption capacity.

Another side of the coin is barriers to innovation. Many environmental blocks affect absorptive capacity (Ali Thawabieh & Saleem, 2016). Contingency theory asserts that contingency factors like environment are interrelated with innovation and knowledge absorption (Donaldson, 2001). So, we researched ease of starting a business, strategy, and Cost of Redundancy in the business environment as three contingency factors that may correlate with AC. The cost of redundancy dismissal, namely the financial cost of avoiding bankruptcy or closing a firm, is related to innovation. High innovative countries have low costs of leaving a business and vice versa (Franco & Oliveira, 2017; Hanafi & Arvanitis, 2013). Additionally, some contingencies negatively influence the organization's innovation related to different environmental contexts (Szulanski, 2000; Tidd, 2001).

H3: Cost of Redundancy Dismissal decreases the absorptive capacity of the firms.

Research Design

In this paper, the effects of cost of redundancy dismissal, ease of starting a business, and cluster development variables on knowledge absorption of organizations

are researched. In this context, the OECD country group was preferred in terms of economic size, development levels, and access to data (Australia, Austria, Belgium, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States). The analysis period covers the 2013-2018 period. The annual data was derived from the World Bank and Global Innovation Index sites. We used the natural logarithms of the data.

With panel data methodology, results give more informative data and more efficiency (Baltagi, 2005); also, there is less collinearity between the variables. Thus, we used panel data. Also, panel data models can better identify and measure the effects than pure cross-section or pure time-series data. Holding the organizations' characteristics constant, we can better analyze how cluster membership affects absorption capacity and how much. The estimation equation is shown in Equation (1).

$$KA_{it} = LNEASE_{it} + LNREDUND_{it} + LNCLUSTER_{it} + e_{it} \quad (1)$$

In Equation (1); knowledge absorption (High-technology exports (LNHE) & Intellectual property payments (LNIPP)), LNEASE: The ease of starting a business, LNREDUND: Cost of redundancy dismissal, LNCLUSTER: State of cluster development, e: error terms and i: 1,…,N (countries) and t: 1,…,T (time).

Variables represented knowledge absorption in the analyses, high-technology exports, and Intellectual property payments. High-technology exports (current US$): "These exports are products or services with high intellectual and research intensity, such as aerospace, IT, medical and healthcare products, scientific instruments, and electronic consumer products". Intellectual property payments (current US$): "Payments for the use of intellectual property rights and services (such as patents, production process, trademarks, copyrights, and franchises) and the licensing agreements applications of produced originals or prototypes (such as copyrights on books and manuscripts, software, plastic arts) and related rights (such as for social media and network performances)". Starting a business is easy to calculate organizations' distance to frontiers' score numbers. These scores are the simple average distance to frontier scores for each component indicator. Cost of redundancy dismissal: "the sum of the notice period and severance pay for redundancy dismissal (in salary time, with a minimum of eight weeks)". The state of cluster development is defined by the average answer to the survey question on the role of clusters in the economy. The question is: "In your area and country, how do clusters common and well-organized (geographic concentrations of firms, supply chains,

producers of related products and services, and specialized industrial organizations in a particular field)?" (Goedhuys et al., 2015)

A spurious regression problem may arise if the stationary of the series is not taken into consideration. Therefore, it is necessary to investigate the stationarity of the series (Esen and Dundar, 2021). The estimation equation for the unit root test is shown in Equation (2).

$$Y_{it} = \mu_i + \tau_i t + \rho\, Y_{it-1} + \delta_i \theta_t + e_{it} \quad (2)$$

The cross-sectional dependence is decisive in choosing the appropriate method for the unit root test. Because the cross-sectional dependence leads to decreased effectiveness of test statistics (Yıldırım et.al., 2020, Yıldırım et.al. 2021). First-generation tests do not consider cross-section dependence, and second-generation tests, on the other hand, consider cross-section dependence (Esen and Bayrak, 2017). First-generation tests are classified as first group tests (ρ is assumed not to change from unit to unit) and the second group (ρ is assumed to vary from unit to unit).

First and Second group unit root tests and basic hypotheses and alternative hypotheses: For the first group,
$H_0: \rho_i = \rho = 1$ (general unit root), $H_1: \rho_i = \rho < 1$ (no general unit root), and for second group tests, $H_0: \rho_i = 0$ (unit root in time series for all units) and $H_1: |\rho_i| < 0$ (unit root in time series for some units). Levin, Lin & Chu (2002) and Im, Pesaran & Shin (2003), which are widely used in the literature, were preferred to analyze stationarity. The LLC test is the first generation, the first group, and the IPS test is the first generation and the second-generation.

Results

Our study obtained preliminary information about the direction and strength of the relations between the series through correlation analysis. Table 1 shows the correlation analysis results.

Table 1
Correlation Analysis

	lnhe	lipp	ease	redund	Cluster
lnhe	1.000				
lipp	0.721	1.000			
ease	-0.211	-0.061	1.000		
redund	-0.106	-0.194	-0.246	1.000	
cluster	0.574	0.694	-0.018	-0.339	1.000

According to the results of the correlation analysis, the first noticeable result is that there are no multiple linear connection problems of the OLS analysis results. On the other hand, correlation results show no multicollinearity between the series. There is a negative correlation between the ease of starting a business, with both high-tech exports and intellectual capital payments. In contrast, there is a negative correlation between high-tech exports and intellectual capital payments. However, there is a positive correlation between being in a cluster, high-tech exports, and intellectual capital payments.

Unit Test results related to the stationarity of the series can be seen in Table 2.

Table 2
Unit Root Tests

		Intercept		Intercept&Trend	
Variables	Methods	Stat.	Prob.	Stat.	Prob.
LNEASE	LLC	-51.766	0.000	-32.074	0.000
	IPS	-7.129	0.000	-3.224	0.001
LNREDUND	LLC	-16.910	0.000	-8.443	0.000
	IPS	-2.980	0.001	0.161	0.564
LNCLUSTER	LLC	-79.034	0.000	-56.815	0.000
	IPS	-13.305	0.000	-7.735	0.000
LNHE	LLC	-3.273	0.001	-21.124	0.000
	IPS	1.714	0.957	0.043	0.517
LNIPP	LLC	-6.376	0.000	-11.993	0.000
	IPS	-0.084	0.467	0.849	0.802

When the results in Table 2 are examined, it can be implied that the LNEASE and LNCLUSTER series are stable for both LLC and IPS tests, according to constants and constants and trendline models. The LNREDUND, LNHE, and LNIPP series, on the other hand, are stationary for the LLC test and stable for both fixed and trendline models. The LNREDUND series is stationary for the IPS test compared to the fixed model, whereas the fixed and trendline model difference is unstationary. Finally, the LNHE and LNIPP series are not stationary for IPS testing and are stable for fixed and trendline models. As a result, it was decided that all series were stationary to minimize information loss.

Estimation of Equation (1) can be made after investigating the stationary state of the series. Equation (1) can be estimated in two ways, including fixed and random effects. The most important difference between the fixed effects results and the random-effects analysis model is whether the independent variables and unit effects are correlated. The fixed-effects model assumes that independent variables and unit effects

are correlated. On the other hand, independent variables and unit effects are not correlated according to the random-effects model. With the Hausman test, which of the fixed or random effect estimators is effective can be analyzed by chip-square distribution. The underlying hypothesis of the Hausman test is established that the random effect estimator is effective. Table 2 shows the Hausman test results.

Table 3
Hausman Test

Equations	***Chi-Sq. Statistic***	***Prob.***
Dependent variable: LNHE	17.748	0.000
Dependent variable: LNIPP	27.880	0.000

According to Table 3, the statistic provides strong evidence against the null misidentification hypothesis. Therefore, it is concluded that the fixed effects model estimator is effective for both forecasting models. Supporting results are shown in Table 4 for the choice of estimators of fixed & random-effects models.

Table 4
Fixed & Random Effect Comparisons

	DEPENDENT VARIABLE: LNHE				***Dependent variable: LIPP***			
Variables	**Fixed**	**Rando**	**Var(Diff.)**	**Prob.**	**Fixed**	**Rando**	**Var(Dif)**	**Prob.**
LNEASE	0.837	0.732	0.002	0.015	-0.022	-0.100	0.001	0.004
LNREDUND	-0.009	-0.036	0.000	0.074	0.013	0.004	0.000	0.342
LNCLUSTER	0.463	0.779	0.004	0.000	0.437	0.589	0.001	0.000

According to Table 4, the coefficients differ for the predictive equations where the dependent variable is LNHE and LIPP. In this regard, the underlying hypothesis that the coefficients do not differ is rejected. The fixed effects model results for both estimation models are shown in Table 5.

Table 5
Fixed Effect OLS Test Results

	Dependent variable: LNHE			***Dependent variable: LIPP***		
Variables	**Coefficient**	**t-Statistic**	**Prob.**	**Coefficient**	**t-Statistic**	**Prob.**
Constant	22.547	14.096	0.000	16.996	8.748	0.000
LNEASE	-0.022	-0.062	0.951	0.837	1.910	0.058
LNREDUND	0.013	0.180	0.858	-0.009	-0.103	0.918
LNCLUSTER	0.437	1.762	0.079	0.463	1.539	0.126

When Table 5 is analyzed, it is seen that the results change when the dependent variable is hi-tech exports and intellectual capital payments. Firstly, when the dependent variable is hi-tech exports, it is seen that the ease of starting companies or the increase in the possibilities of avoiding bankruptcy does not have a statistically significant effect on

high-tech product exports. On the other hand, a firm's inclusion in a cluster affects positively and statistically significant. A one-unit increase in the cluster's involvement increases high-tech exports by 0.4 %.

In the other part of the table, it is seen that when the dependent variable has intellectual capital payments, being a member of a cluster or getting rid of the cost of redundancy dismissal does not have a statistically significant effect on intellectual capital payments. On the other hand, the ease of starting a business has a positive and statistically significant effect on intellectual capital payments. A one-unit increase in the ease of starting a business increases intellectual capital payments by 0.8 %.

Discussion

This paper discusses the effects of clusters and the business environment on the knowledge absorption capacity of the organizations. Because the knowledge transfer occurs between parties relative to their context (Lane et al., 2001). We used high-technology exports and intellectual capital payment variables as a proxy for knowledge absorption capacity and ease of starting a business to study these concepts. We used the cost of redundancy dismissal variable as the proxy of the business environment.

Successful organizations create value through absorption and extract that value by strategically leveraging their intellectual property to enhance their competitive position. A significant positive impact of international trade on productivity growth also has been found at the country-level and firm-level (De Loecker, 2007). Nevertheless, the results are contradictory for the domestic level (Harrison, 1995). Additionally, in the previous literature, absorption capacity measurement is problematic when analyzing from the national and sector perspective rather than from the firm and product levels perspective (Jaffe, 1989; Vicente, 2018). This paper aims to support these previous study results and bring further depth and breadth to the literature. First, we provide an empirical contribution by new external knowledge absorption proxy variables. Another critical contribution analyzes the importance of cluster effects from network relations. Lastly, there are methodological contributions from results concerning a more definite identification of “learning through exporting” phenomena and individual factors at the national level from the intellectual property perspective.

According to panel data analysis, Hypothesis 1 (Being a cluster member positively increases the knowledge absorption capacity) is partially accepted depending on the proxy variable of the knowledge absorption capacity. Being in the clusters increases the exports of hi-tech firms by 0.4% more. When the proxy is high-tech exports, firms are hi-tech export intended to be in the cluster positively increases. These results are coherent with the research of Dai and Yu (2013). They claimed that absorptive

capacity developed through pre-export R&D investment. These results also support the idea that firms' participation in the export market makes them more productive, which is a phenomenon known as "learning through exporting," Although this belief has not always been supported by empirical research at the firm level (Goldberg et al., 2008) we have proofed it at the spatial cluster level. Relationships between local firms and multinationals can equally important serve as a knowledge absorption catalyst (Pack & Saggi, 2001; Radovanovic & Matovic, 2016). Like these relations, clusters are likely to play a significant role in the knowledge absorption context, but hi-tech clusters (Pan et al., 2019). Our country-level data, described in the methodology, measure how participation in such cluster networks affects the adoption of new-to-the-firm technology. Therefore, cluster formation can be the spatial limit to the external absorption capacity.

However, when intellectual property payments are a dependent proxy variable of knowledge absorption capacity being in the clusters and the cost of redundancy dismissal has no significant effects. This result is supported by other researchers (Ahmed et al., 2019; Audretsch & Lehmann, 2005; Wellman, 2009) that interaction among employees is more crucial than organizational networks. The absorption process is facilitated by the country, firm, and individual-level factors (Gaur et al., 2019); their importance may change contingently. Nevertheless, the ease of starting a business has significant positive effects. When starting a business is comfortable talented people get courage, but the firm is not sustainable as they think. So, when the dependent variable is intellectual property, payments ease of starting a business is a significant positive effect that Hypothesis 2 is partially accepted.

Hypothesis 2 is partially excepted because the ease of starting a business is significant when the firms start this process out of clusters. However, when the ease of starting a business is statistically relevant, it affects absorption capacity. That is because the competition in the clusters may be too stiff for a new entry, or the industry is expensive to leave after investment. That brings us to Hypothesis 3, which argues that the Cost of Redundancy Dismissal decreases the firm's absorptive capacity. Hypothesis 3 is accepted because when firms are in the clusters and exporting, the Cost of Redundancy Dismissal or avoiding bankruptcy is no longer related to absorption capacity. Additionally, when intellectual property payments are a proxy of absorption capacity, still the cost of redundancy dismissal is not significant. However, according to the correlation table, it decreases the absorption capacity.

The outcomes of this study enrich the theoretical foundation of absorptive capacity and network and provide critical contributions to the cluster of high-technology exporter firms. The outcomes may provide important implications for high-tech cluster enterprises that attempt to improve exports and knowledge absorption capacities and

nations that try to compensate for the business environment for companies. At a national level, being a member of cluster formation is especially productive for hi-tech exporting firms. Thus, nations with the most extensive knowledge stocks will thereby produce newer knowledge through a more open exportation process. However, at the individual level, the ease of starting a business should include economic means and intellectual capital dimensions.

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Moderation role of government policies, laws and Acts between cultural factors and risk management among Saudi Arabian contractors

Muhammad Abdul Rehman and Md Sayuti Bin Ishak
School of Civil Engineering, Universiti Sains Malaysia

Projects are delayed due to lack of construction risk management practice. One of the important factor for project success is organisation culture. Organisation culture is the combination of system of shared norms and values that defines characteristics and behavior. This study is grounded on organisation control theory and based on Kingdom of Saudi Arabia (KSA) 303 largest contractor (> 250 number of employees). This study quantitatively focused on impact of cultural factors on management of risks in construction sector of Kingdom of Saudi Arabia (KSA) moderated by government policies, laws and Acts using PLS-SEM approach. Parameter calculations in SmartPLS (PLS-SEM technique) is efficient having higher statistical power making it appropriate approach for analysing composite model for this study. Cultural factors and government policies, laws and Acts positively affect the management of risks in construction sector of Kingdom of Saudi Arabia (KSA) with addition to moderating role of government policies, laws and Acts. Current research helps project team for project success to develop good culture within client, consultant and contractor, which makes project team members, construction and project manager towards project commitment. It is essential for every organisation to practice strong culture for project accomplishment which greatly influence the project team behavior compared with weak culture affecting project team effectiveness .

Keywords: Organisation control theory, cultural factors, government policies, laws and Acts, risk management, construction management

An unfavourable and undesired consequence and result of activity performed is called risk (Crane et al., 2013). Identifying, evaluating, treating, monitoring and responding are five risk management processes in construction sector (Ripley, 2020). Risk is always present in all human activities (Szymański, 2017). Workforce, resources, administration, materials and drawings of project are main risk factors which causes delaying in construction projects with increased budget (El-Sayegh, 2008).

Correspondence regarding this manuscript should be communicated to Mr. Muhammad Abdul Rehman, Research Scholar at School of Civil Engineering, Universiti Sains Malaysia, Malaysia. Email: m-abdul-rehman@hotmail.com

Project objectives are fulfilled by efficiently managing construction risks which include identifying, examining and responding to risks involved in the project (Zou et al., 2007). Lack of proper management of risks causes project budget to increase resulting in project delays (Andi, 2006). Eliminating all risks from the construction project is not possible due to intricacy and ramification of nature of project (Wang et al., 2004). Ineptitude and incompetency of project manager in responding to project risks causes delaying in the accomplishment of project with augmented budget (Thuye et al., 2007).

In the world, the effective and appropriate management of risks in construction sector has been of great concern. It can be witnessed by the research in Vietnam by Thuye et al., (2007), in Nigeria by Aibinu and Jagboro (2002), in Malaysia by Sambasivan and Soon (2007), in India by Ling and Hoi (2006), in Kuwait by Kartama and kartamaba (2001), in China by Gao et al. (2019), in Pakistan by Hameed and Woo (2007) and in Indonesia by Andi (2006). The practice of management of risks is country-specific and depends on many factors e.g. the conditions of politics, culture and finance (Andi, 2006).

Theoretically, Dikmen et al., (2008) introduced a new approach of effectively managing various construction risk factors by developing a tool, which is based on learning approach of risk occurrence from previous projects in reducing risk. The construction project goals are not fulfilled due to inferior and substandard quality, requirement creep, unexpected time delays and incurred costs, but they all were not able to examine the risk management ineffectiveness and extent from material, management, finance, design, equipment and labour (El-Sayegh, 2008; Walker, 2015).

The key construction risk factors in kingdom of Saudi Arabia (KSA) are contractual duration, eccentricities in project scope, mistakes and frequent changes in project drawings, and specification changes in project, which can effectively be cover with appropriate implementation of management of risks in construction sector (Littlejohn & Foss, 2009).

Any country's growth relies on construction projects. The basic facilities e.g. health, food and education can only be provided to the people with proper infrastructure development which are built by construction companies. KSA construction companies contributes 23.27% of Gross Fixed Capital Formation in the third quarter of 2020. GDP (from Construction) in Saudi Arabia increased in the third quarter to 30.163 billion Saudi Riyals of 2020 from 27.204 billion Saudi Riyals in the second quarter of 2020 (Satistics, 2021). However, risk management is ineffective because of poor construction quality in term of economy based on certain construction risks e.g. materials, management, design, labor, finance and equipment risks.

Literature Review

KSA construction sector

Construction industry in KSA is linked with economic development. KSA is among few countries, which exports the highest quantity of oil to the world. The

economic condition of KSA is growing which boom the construction industry. Construction of new housing schemes, factories and infrastructure development makes high scope of construction in KSA (Husein, 2014).

According to KSA vision 2030, foreign construction companies are limited to apply for foreign investment license due to restrictive requirements imposed by KSA government to engage into development activities. Sharia-compliant finance, project finance and conventional finance are three substantial methods to finance any project in KSA. Ministry of Finance is a state agency responsible to approve any government project, which once approved is awarded to contractor after bidding process following the Saudi standards for contract. Share pledges, parent company guarantees, promissory notes and bank guarantees are major forms of investment security handed over to funders. Any fraud, deception, dishonesty, cheating or deceive from project execution to completion committed by the contractor is reported to Ministry of Finance KSA (Husein, 2014).

During 2015-2018, construction sector suffered low growth in KSA due to crude oil prices collapse. Lower crude oil prices cause major concern for investors resulting KSA government to impose various steps (e.g. cutting major budget for defense, education, healthcare and removing fuel subsidies) to sustain economy, which causes major reduction in construction activities in KSA. Due to major reforms in KSA and crude oil stability, the construction activities are predictable to rise from 2020 onwards (ITA, 2020).

Overview of Project Management

According to Larson (2010), meeting the owner needs by non-repetition of events, which are limited to time, specifications and resources is called project. According to Project Management Institute (PMI) (2008), a project is defined as interim venture to produce a distinctive product, result or service.

Utilizing of available resources in a meticulous, planned and organised way for archiving well-defined goals in the presence of constraints set is termed as Project Management. Defining (objectives and goals of project, risks involved, scope and cost, time duration and methods and techniques), initializing (declaration of business case, decision on project scope, setting of expectations of stakeholders), executing, monitoring, control and closure are six phases of project (Haughey, 2014).

Risk Management

An unpredicted and unforeseen consequences and effects of action completed is called risk (Crane et al., 2013). Categorising, estimating, handling, monitoring and responding are five risk management processes in construction sector (Ripley, 2020).

For implementation of management of risks in project, it is important to start planning process, followed by identification and analysis. Identification and analysis result further initiate the process of response planning, implementation and monitoring of

risks involved in the project resulting the impact or probability increase for the positive risks involved and impact or probability decrease for the negative risks involved, optimizing the project accomplishment chances (PMI, 2017).

Identification of Risk Factors

In Pakistani construction industry, Bajwa and Syed (2020) ranked 29 construction risk factors. Using quantitative approach by distributing questionnaires (distributing 126 and analyzing 115 as 11 questionnaires were incomplete), the study resulted that political and economic risks are the most critical factors affecting construction project.

Using extensive literature review, Farid et al., (2020) examined 283 risk factors in Pakistani construction companies. Qualitative approach was adopted with Relative Importance Index (RII) technique by distributing 122 questionnaires (out of which only 52 answered) to construction experts working in Pakistan. With conduction frequency analysis method, 66 (44 internal and 22 external) risks factors were used for analysis. The findings showed that poor decision making, unforeseen obstacles causing construction interruptions and delays in payments are among top three risk factors affecting construction sector.

Using extensive literature review and construction expert input from Indian construction companies, Devi and Ananthanarayanan (2017) examined 68 construction risk factors in India. The findings show that construction deferments, scope creep and lowest bidder tender awarding are major causes of cost overrun in Indian construction sector.

Utilising MATLAB application, Sharaf and Abdelwahab (2015) evaluated 73 highway risk factors in Egyptian construction companies. By examining the data collection from building records, project experts feedback and past literature reviews, Abusafiya and Suliman (2017) specified 45 construction risks in Bahrian. Quantitative approach was adopted with Relative Importance Index (RII) technique by distributing 103 questionnaires (out of which 74 responded consisting of 11 engineers from client perspective, 21 engineers from consultant perspective and 44 engineers from contractors' perspective). The findings show that design changes, lag in planned activities and poor decision making are top three causes of cost overrun in Bahraini construction sector.

Algahtany et al., (2016) have examined 7 risk factors (scope change, lacking of experience from client' employees, change order, design errors, changes in project specifications, alternations in drawings by client or consultant and unrealistic time duration of completion of project) in KSA. The findings show that adoption to new risk management model (IMT and PIPS) reduces management from client perspective to 80% and overall efficiency increment of 40%.

Tang et al., (2007) examined the ineffective management of risks in chinese construction sector. Interviews and questionnaires with Dilemmas analysis method was

adopted and questionnaires were distributed to examine the effect of 32 risk factors (from extensive literature review). The findings show that 6 factors (safety, lack in coordination, lack of advance technology, clashes and claims, early facility failure and management intervention) are critical factors in Chinese construction sector.

Zou et al. (2007) quantified and ranked 25 risk factors in Chinese construction industry. 32 risk factors were further categorised into contractor, sub-contractors and suppliers, client, designers, government department and external issues. Results show that client, design and supervision consultant and contractor should work together to develop risk management plan to encounter risk for effective risk management during initial stage.

Cultural factors

Organisation cultural is external adaptation and internal integration among people of society to treat problem and communicate to new individuals for perseveration (Schein & Schein, 2016). The effects of culture can be viewed among community for a specific activity (Walker, 2015). It is essential for every organisation to practice strong culture for project accomplishment as it greatly influence the project team behavior compared with weak culture as it affects project team effectiveness (Schein & Schein, 2016).

Organisation culture is the combination of system of shared norms and values that defines characteristics and behavior (Schein & Schein, 2016). Hartog and Verburg (2004) recommended that culture of organisation acts as powerful tool to deal with construction risks, which is linked with team members, contractor or project manager's attitude and behavior. Employee commitment is positively connected with organisational development (Gul, 2015). Knowledge management practices are directly linked with organisational performance (Ahmed et al., 2015). Culture plays an important role in improving financial policy of any organisation (Khan & Sultana, 2021).

Basic assumptions (e,g. nature of human being, relationship between management and enviornemtn) is first level, shared values (e.g. standard regulations for judging employees, circumstances and actions etc.) is second level and artefacts (e.g. dress code and organisation structure design etc.) is third level of cultural practices in organisation (Schein & Schein, 2016). It is important for project success to develop good culture within client, consultant and contractor which makes project team members, construction and project manager towards project commitment (Schraeder & Tears, 2004; Barbosa & Cardoso, 2007).

Construction Risk Management

Based on extensive literature review, five dimensions of construction risk management factors in KSA includes material risk, administrative or management risk, design risk, equipment and labor risk, and finance risk (Rehman & Ishak, 2021; El-Sayegh, 2008; Jarkas & Haup, 2015).

Equipment and labor risk

Different categories of people are required to work for completion of projects in construction industry. The project success is largely depending on coordination among client, design consultant, supervision consultant, contractor, sub-contractor and material suppliers as they are vital components of construction industry. Construction cost of a project largely depends on labors, which are considered as most influential portion of construction industry (Gunduz & Hijleh, 2020).

Design Risk

Deficient and inadequate design is one of the reason of time overrun in construction project. Delays in construction project takes place due to slow response time from designer and incomplete project drawings. Designs in the construction project are frequently changing during implementation phase (Banobi & Jung, 2019).

Financial Risk

Instability of economic and politics of a country, recession, inflation, credibility of client and inadequate cost plan are financial risks of great importance (Szymański, 2017). All factors related with difficulties in finance and cost during execution and construction of project are directly falling under financial category (Alaghbari et al., 2007). Finance risk is the main cause of any construction delay as project performance and success is largely depending on it (Alaghbari et al., 2007; Sweis et al., 2008).

Material Risk

Project performance and success are greatly affected by the material risks involved during construction. Delay and shortage of materials to be supplied on the construction site is one of the most critical risk faced worldwide. Material availability or origin, varying demand, poor quantity surveying and lack of good workmanship are major reasons of material shortage in the market. Labor efficiency, trade restrictions imposed by government, intemperate weather, lack of decision making ability, inadequate planning and logistics are major reasons of delay of material supply on the site (Rahman, et al., 2017).

Administrative or Management Risk

Management related risks in construction projects are of great importance as project performance and completion within time and cost depends on it. Lack of human resource and management skills are critical construction delay causes in KSA as it negatively influences the project process and performance resulting heavy loses. It was recommended to apply computer software systems (e.g. ACMS) to enhance project management within construction (Sidawi, 2012). It is crucial and vital for construction and project manager to apply management techniques to prevent risk occurrence on the construction site (Iqbal et al., 2015). This is in line with the study of Dmaidi et al., (2016) that shows management and administrative risk have high influence on construction industry of Jordan.

GOVERNMENT POLICIES, LAWS AND ACTS

Government Policies, Laws and Acts

In G7 Malaysian contractors, Taofeeq et al., (2020) highlighted the moderating effect of government policies, standards and acts which positively affect attitudes of risk with expert competency, employee experience and workforce fitness.

In hydrological projects of Kenya, Maina et al., (2017)) highlighted the moderating effect of government policies, standards and Acts which positively affect investment with recovery.

Adeleke et al., (2016) confirmed the moderating effect of government policies, standards and acts which positively affect culture factors with management of risks in Nigerian contractors. In Scotland, government regulations and standards highly influence rental cost (Gibb, 2011).

According to Niu (2008), frequent alternations in construction policies highly influence housing programmes in Chinese development sectors. Government standards in the housing schemes postively influence management of risks in construction industry of Malaysia (Ismail et al., 2012). Installation of industrialised building system (IBS), which requires approval from government sector, helps in improving the quality of construction, saving time and money (Mydin et al., 2014).

Government sector is largely impacted by the political forces (Shafiq et al., 2017). Workforce health and safety programs in construction sectors, which are exposed to hazad chemicals and tough enviromental conditions, are enforced by the government which positively impact the performance of construction project (Sivaprakash & Skanchana, 2018).

Organisation Control Theory

Relationship confirmation between government policies, standards, laws and Acts on managing risks in construction industry and cultural risk factors can be described theoretically by organisation control theory. Rendering to organisation control theory, establishment and implementation of proper control must theoretically moderate occurrence of risk on project (construction) in connection with proper monitoring, controlling and compensating team players, project managers and organisation itself assuming that occurrence of risk can be reduced through government policies, standards, laws and Acts (Jaworski, 1988; Ouchi, 1979; Flamholtz et al., 1985).

Risks within organisation can be reduced by adopting organisation control procedures. The study of Adeleke et al., (2018) inferred that cultural factors positively affect management of risks in construction sector. Occurrence of risks is reduced on construction projects through proper controlling implemented by rules and regulations (Lai et al., 2005).

Conceptual Framework and Hypothesis Development

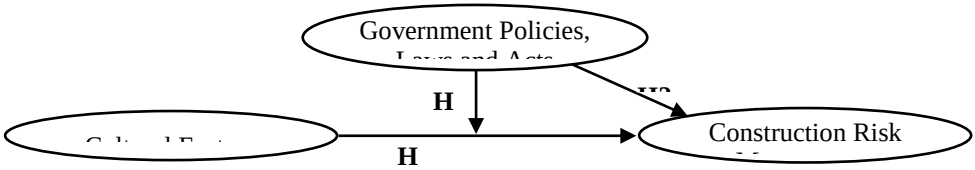

Figure 1 Conceptual Framework

Hypothesis 1: Cultural factors significantly affect management of risks in Kingdom of Saudi Arabia construction industry.

Hypothesis 2: Government Policies, Laws and Acts significantly affect management of risks in Kingdom of Saudi Arabia construction industry.

Hypothesis 3: Government Policies, Laws and Acts significantly moderate cultural factors on management of risks in Kingdom of Saudi Arabia construction industry.

Method

Epistemology and Nature of Present Study

Individual ideas, emotions and views independently provide empirical facts (evidence are collected through value free manner), nature of investigation is statistical, cause and effect laws provide evidence which are empirical in nature, assumption of structured methodology with the provision of repetition, constant certainty patterns and additive knowledge are basic characteristics of positivist paradigm approach. Empirical approaches and statements are adopted in social survey is the underpinning of quantitative research. Analysis is performed on numerical data using statistical approach in quantitative research (Creswell & Creswell, 2018; Apuke, 2017; Creswell et al., 2004).

Population

There are total 361 big company size contractors which contributes 8.87% of total contractors (SCA, 2021). 361 (consisting of corporations, Limited Liability Company, general partnership and sole proprietorship) registered big size companies (contractors with number of employees greater than 250) have been chosen in this research because small business companies possess a basic form of risk and lower market value whereas the bigger business companies are in the higher rate of risk. Population consist of CEO, project managers, construction managers, engineers, supervisors. foremen and others.

Sampling

For this study, simple random probability sampling method is employed as discrete and definite likelihood exists in every group of population. The minimum required sampling size is 190 for 361 population size (Aarons, 2021). This sampling size is in line with the calculation of G*Power software and Krejcie and Morgan (1970) formula.

Data Collection

The researcher is responsible for administering the questionnaire to the targeted participants. There are minimum 190 duly filled questionnaires required for quantitative data analysis. Responding to any inquiry from participant and achieve good response rate, physical questionnaire distribution among KSA contractors is selected resulting into time saving through immediate response.

In order to serve the purpose of present research, a single respondent from each big size contractor company is sufficient. Collection of data from CEO, project manager, construction manager, engineer, supervisor and foreman through questionnaire help in assisting the clarity of relationship between cultural factors that influence on construction risk management.

370 questionnaires were circulated among the selected companies in the KSA as the target participant. 303 completed questionnaires were used for evaluation of extent of construction risk management as 19 were partial or unfinished survey responses. Therefore, 81.9% is a valid completion rate for this study.

Variable Measurement and Operationalisation

Research adopted 5 point Likert scale from the study of Moshood et al. (2020) for extent of occurrence of risks.

Table 1

Constructs Variables, Scale, Indicators and Source

Constructs	Variables	Indicators	Source
Cultural Factors	Cultural factors	6	(Rehman & Ishak, 2021)
Construction Risk Management	Administrative or management risks	4	(Adeleke et al., 2016)
	Equipment and labor risks	5	(Rehman & Ishak, 2021)
	Finanical risks	4	(Adeleke et al., 2016)
	Design risks	4	(Rehman & Ishak, 2021)
	Material risks	4	(Adeleke et al., 2016)
Government Policies, Laws and Acts	Rules and regulations	5	(Adeleke et al., 2018)

Statistical Analysis

This study utilises SmartPLS v3.3.3 software (underpinning of PLS-SEM) for performing statistical analysis. In PLS-SEM, explained variation of endogenous variable have maximum iterations (Hair Jr et al., 2014). Also, assumption of distribution of data is not require for intricate and complicated modeling, which makes it causal prediction approach (Hair et al., 2019). Common factor method (assessing structural modelling's circular relationships) is the underpinning of CB-SEM whereas PLS-SEM is composite based approach for handling intricate and complicate modeling efficiently (Hair Jr et al., 2014).

Intricate and complicate modeling is efficiently and accommodatingly handled in smartPLS v3.3.3 including nonlinearity in relations, second-order models and moderating effect, which makes smartPLS v3.3.3 appropriate tool for this study (Sarstedt et al., 2014).

Results

Table 2

Demographic Profile of Participants

Variables	Classification	Occurrence	Percent (%)
Gender	Male	215	71
	Female	88	29
Position in the Company	CEO	7	2.3 (100% Male)
	Project Manager	16	5.3 (100% Male)
	Construction Manager	27	8.9 (100% Male)
	Engineer	109	36 (90% Male and 10% Female)
	Supervisor	25	8.3 (100% Male)
	Foreman	34	11.2 (100% Male)
	Others	85	28.1 (10% Male and 90% Female)
Working Experience	< 1 year	24	7.9 (25% Male and 75% Female)
	1 to 5 years	42	13.9 (50% Male and 50% Female)
	6 to 10 years	141	46.5 (79% Male and 21% Female)
	11 to 15 years	56	18.5 (82% Male and 18% Female)

	> 15 years	40	13.2 (78% Male and 23% Female)

Table 3
Companies Demographic Profile

Variables	Classification	Occurrence	Percent (%)
Company Specialty	Mining support services	22	7.3
	Waste management	27	8.9
	Building constructions	131	43.2
	Consultancy	26	8.6
	Specialised construction works	31	10.2
	Landscaping works and building maintenance	66	21.8
Company Existence	< 1 year	8	2.6
	1 to 3 years	30	9.9
	4 to 6 years	77	25.4
	7 to 10 years	95	31.4
	Greater than 10 years	93	30.7
Fulltime Employees	250 – 275	35	11.6
	276 – 300	82	27.1
	301 – 325	75	24.8
	326 – 350	72	23.8
	> 350	39	12.9

Measurement Model Assessment

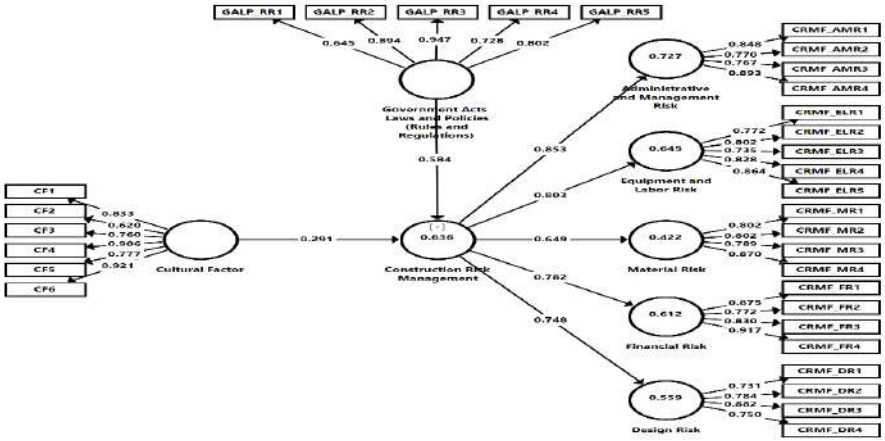

Figure 2 Measurement Model

Table 4 is the fulfillment of Internal Consistency Reliability quality criteria i.e. Composite Reliability (CR) is higher than 0.60 and lower than 0.95 along with Cronbach's Alpha, which is higher than 0.70 (Hair et al., 2019).

Table 4
PLS Algorithm Result

Constructs	Items	Loadings	Cronbach's Alpha	CR	AVE
Cultural Factors	CF1	0.833	0.891	0.918	0.655
	CF2	0.620			
	CF3	0.760			
	CF4	0.906			
	CF5	0.777			
	CF6	0.921			
Administrative and Management Risk	CRMF_AMR1	0.848	0.839	0.892	0.674
	CRMF_AMR2	0.770			
	CRMF_AMR3	0.767			
	CRMF_AMR4	0.893			
Equipment and Labor Risk	CRMF_ELR1	0.772	0.861	0.899	0.642
	CRMF_ELR2	0.802			
	CRMF_ELR3	0.735			
	CRMF_ELR4	0.828			
	CRMF_ELR5	0.864			

Material Risk	CRMF_MR1	0.802	0.833	0.888	0.666
	CRMF_MR2	0.802			
	CRMF_MR3	0.789			
	CRMF_MR4	0.870			
Financial Risk	CRMF_FR1	0.875	0.871	0.912	0.723
	CRMF_FR2	0.772			
	CRMF_FR3	0.830			
	CRMF_FR4	0.917			
Design Risk	CRMF_DR1	0.731	0.798	0.868	0.623
	CRMF_DR2	0.784			
	CRMF_DR3	0.882			
	CRMF_DR4	0.750			
Rules and Regulations	GALP_RR1	0.645	0.864	0.904	0.657
	GALP_RR2	0.894			
	GALP_RR3	0.947			
	GALP_RR4	0.728			
	GALP_RR5	0.802			

Convergent Validity

The extent of measure of latent variable in relation to other measure of variables is confirmed by convergent validity (Cheah et al., 2018). For this study, convergent validity is confirmed when AVE has larger value than 0.50 and CR has larger value than 0.60 (Fornell & Larcker, 1981).

Discriminant Validity

The dissimilarity of two or more variables can be accessed by discriminant validity (Rönkkö & Cho, 2020). The core goal of attaining discriminant validity is to establish the uniqueness of variables having robust connection with the indicators (Hair Jr. et al., 2017).

Heterotrait-Monotrait ratio (HTMT), cross loadings and Fornell-Larcker criterion are three methods in which discriminant validity can be accessed (Henseler et al., 2015; Chin, 1998; Fornell & Larcker, 1981; Mora et al., 2012).

The criteria of cross loadings are satisfied in table 5. Cross loadings are lower corresponding to outer loadings of each variable respectively (Chin, 1998; Mora et al., 2012).

Table 5
Cross Loading

	CF	CRMF_AMR	CRMF_DR	CRMF_ELR	CRMF_FR	GALP_RR	CRMF_MR
CF1	**0.833**	0.414	0.408	0.395	0.342	0.389	0.286
CF2	**0.620**	0.277	0.383	0.268	0.318	0.300	0.298
CF3	**0.760**	0.482	0.460	0.387	0.454	0.593	0.366
CF4	**0.906**	0.541	0.469	0.453	0.491	0.589	0.352
CF5	**0.777**	0.455	0.323	0.421	0.281	0.458	0.219
CF6	**0.921**	0.646	0.444	0.501	0.398	0.592	0.379
CRMF_AMR1	0.510	**0.848**	0.560	0.568	0.441	0.579	0.460
CRMF_AMR2	0.402	**0.770**	0.442	0.291	0.404	0.517	0.388
CRMF_AMR3	0.442	**0.767**	0.439	0.449	0.422	0.574	0.362
CRMF_AMR4	0.579	**0.893**	0.492	0.612	0.546	0.640	0.431
CRMF_DR1	0.268	0.420	**0.731**	0.375	0.333	0.315	0.146
CRMF_DR2	0.291	0.327	**0.784**	0.202	0.297	0.327	0.134
CRMF_DR3	0.486	0.596	**0.882**	0.526	0.447	0.543	0.340
CRMF_DR4	0.520	0.463	**0.750**	0.328	0.519	0.547	0.389
CRMF_ELR1	0.447	0.483	0.458	**0.772**	0.465	0.417	0.361
CRMF_ELR2	0.407	0.372	0.302	**0.802**	0.375	0.464	0.225
CRMF_ELR3	0.266	0.305	0.341	**0.735**	0.308	0.293	0.194
CRMF_ELR4	0.418	0.524	0.363	**0.828**	0.479	0.543	0.378
CRMF_ELR5	0.459	0.643	0.418	**0.864**	0.459	0.532	0.395
CRMF_FR1	0.380	0.500	0.489	0.501	**0.875**	0.455	0.256
CRMF_FR2	0.278	0.344	0.382	0.358	**0.772**	0.336	0.314
CRMF_FR3	0.468	0.498	0.442	0.444	**0.830**	0.596	0.349
CRMF_FR4	0.480	0.527	0.448	0.483	**0.917**	0.552	0.343
GALP_RR1	0.369	0.538	0.446	0.240	0.308	**0.645**	0.305
GALP_RR2	0.440	0.444	0.437	0.449	0.447	**0.894**	0.452
GALP_RR3	0.605	0.670	0.558	0.544	0.548	**0.947**	0.484
GALP_RR4	0.403	0.373	0.299	0.536	0.432	**0.728**	0.408
GALP_RR5	0.617	0.764	0.529	0.500	0.549	**0.802**	0.366
CRMF_MR1	0.277	0.450	0.212	0.470	0.292	0.332	**0.802**
CRMF_MR2	0.338	0.400	0.306	0.295	0.299	0.425	**0.802**

CRMF_MR3	0.295	0.307	0.228	0.198	0.248	0.351	**0.789**
CRMF_MR4	0.379	0.456	0.355	0.313	0.357	0.512	**0.870**

The criteria of Fornell-Larcker is satisfied in table 6. The largest correlations of other variables are lower than the AVE square of each variable (Fornell & Larcker, 1981).

Table 6
Fornell-Larcker Criterion

Constructs	**CRMF_AMR**	**CF**	**CRMF_DR**	**CRMF_ELR**	**CRMF_FR**	**GALP_RR**	**CRMF_MR**
CRMF_AMR	0.821						
CF	0.595	0.809					
CRMF_DR	0.591	0.515	0.789				
CRMF_ELR	0.598	0.507	0.474	0.801			
CRMF_FR	0.555	0.478	0.520	0.529	0.850		
GALP_RR	0.705	0.617	0.569	0.571	0.577	0.810	
CRMFMR	0.501	0.396	0.340	0.400	0.370	0.500	0.816

The criteria of HTMT is satisfied in table 7. The HTMT value of all variables in this study is less than 0.85 (Henseler et al., 2015).

Table 7
HTMT Criteria

Constructs	**CRMF_AMR**	**CF**	**CRMF_DR**	**CRMF_ELR**	**CRMF_FR**	**GALP_RR**	**CRMF_MR**
CRMF_AMR							
CF	0.668						
CRMF_DR	0.698	0.588					
CRMF_ELR	0.668	0.566	0.541				
CRMF_FR	0.640	0.533	0.605	0.598			
GALP_RR	0.814	0.677	0.656	0.643	0.648		
CRMFMR	0.589	0.455	0.389	0.448	0.432	0.585	

Structural Model Assessment

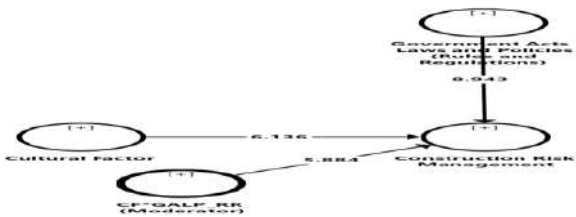

Figure 3 Structural Model

Path Coefficients

Non-parametric method is engaged for this study. 303 cases with 5000 sub samples are run in smartPLS v3.3.3 bootstrapping (Hair Jr. et al., 2017). Bootstrapping result with two tailed test (statistical significance at 5%) is shown in table 8.

Table 5

Bootstrapping result

	Original Sample (O)	Sample Mean (M)	STDEV	t Statistics	p Values
CF →CRMF	0.371	0.370	0.060	6.136	0.000
GALP_RR → CRMF	0.491	0.488	0.055	8.943	0.000
CF * GALP_RR → CRMF	0.257	0.259	0.044	5.884	0.000

Hypothesis 1 is accepted (P value is less than 0.05) that cultural factors positively affect management of risks in Saudi Arabian construction industry.

Hypothesis 2 is accepted (P value is less than 0.05) that government policies, laws and Acts positively affect management of risks in Saudi Arabian construction industry.

Hypothesis 3 is accepted (P value is less than 0.05) that government policies, laws and Acts positively moderate cultural factors on management of risks in Saudi Arabian construction industry.

Explained Variance of Endogenous Construct

According to Hamilton et al., (2015) and Lewis-Beck and Lewis-Beck (2016), the empirical prediction of variance portion of independent construct (or constructs) from dependent construct (or constructs) is referred as coefficient of determination (R^2). According to Rigdon (2012), it is empirical number which represents the prediction power within the sample. R^2 value higher than 0.67 represents higher predictive power, 0.33 to 0.67 represents medium predictive power, 0.19 to 0.33 represents lower predictive power and less than 0.13 represents very low predictive power. R^2 value of management of risks in Saudi Arabian construction industry is 0.703 referring to predictive power lying in medium category.

Effect Size of Latent Variable

The robustness of relation between constructs is governed empirically by effect size (Selya et al., 2012). Effect size value 0.02 refers to lower relation strength, 0.15 refers to moderate relation strength and 0.35 refers to higher relation strength (Cohen, 1988). Cultural factors have effect size of 0.27 referring to moderate strength of relation on management of risks in Saudi Arabian construction industry.

Predictive Relevance (Q^2)

For calculation of research model's predictive relevance, the current research has applied blindfolding procedures using Stone-Geisser test (Stone, 1974; Geisser, 1974). It is out of sample prediction (Hair Jr. et al., 2017). In PLS-SEM, it acts as

measure of goodness of fit (Sarstedt et al., 2014; Rigdon, 2012). It is of great concern if the value of Q^2 (empirically out of sample relevance) is lesser than zero (Chin, 2010). Management of risks in Saudi Arabian construction industry is 0.259 (represented in table 9) which is higher than zero, so this study satisfies predictive relevance criteria.

Table 6
Cross-Validated Redundancy

Total	SSO	SSE	$Q^2 = 1-(SSE/SSO)$
CRMF	6363	4714.861	0.259

Testing Moderating Effect

The present research has utilised the product indicator technique with PLS-SEM for estimation of moderation role of government policies, laws and Acts on the relationship among cultural factors with risk management related to construction among KSA contractors. Product Indicator technique utilises all indicators possible pair combinations interaction of latent variable and latent moderator (Becker et al., 2018; Hair Jr. et al., 2017). The positive moderation strength of relationship is highlighted in Figure 4.

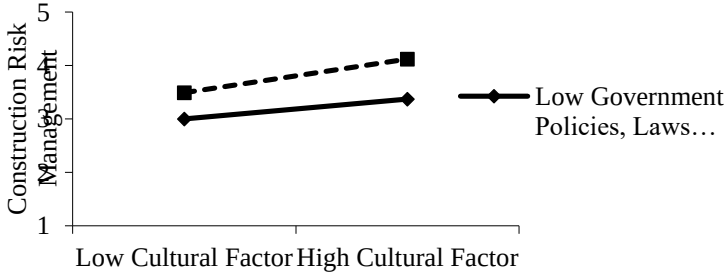

Figure 4 Moderation Effect

Effect Size of Endogenous Variable

The effect size of management of risks in Saudi Arabian construction industry (endogenous variable) is calculated to ascertain the moderating interaction strength of government policies, laws and Acts (Cohen, 1988).

The effect size (strength of moderation) of management of risks in Saudi Arabian construction industry (endogenous variable) is determined using R^2 value with and without moderating variable in the model (Henseler et al., 2009).

Effect size value 0.02 refers to lower relation strength, 0.15 refers to moderate relation strength and 0.35 refers to higher relation strength (Cohen, 1988). Table 10

shows the effect size of management of risks in Saudi Arabian construction industry is 0.182 referring to moderate strength.

Table 7
Effect Size of Endogenous Variable

Endogenous Latent Variable	R^2 (Included)	R^2 (Excluded)	f^2	Effect Size
CRMF	0.703	0.649	0.182	Moderate

Discussion

Cultural factors positively impact management of risks in Saudi Arabian construction sector which aligns with the study of Adeleke et al., (2018) for construction sector in Nigeria and Omer el al., (2021) for construction sector in Malaysia. For projects to be completed with allotted budget and timeframe, culture factors within organisation depends on high aptitude required for monitoring activities, concentration to minor details and strong competency for managing programmes. Theoretically, organisation control theory elaborates precise, right and accurate controlling of available resources, this study demonstrates the environmental aspect where people adapt for featuring the operation of different activities involved in construction project.

In construction business, relying only on large profits and big financial returns is not sufficient for being successful in the market without considerating the importance of cultural factors where misunderstandings and conflicts can cause higher damage to reputation. The construction projects are delayed or failed when lack of attention, importance or mismanagement of cultural factors takes place. This study has filled the gap (theoretical) based on inconsistent results from past studies of management of risks imposing high need of moderation required among relationships (Dikmen et al., 2008; Niu, 2008; Oyegoke et al., 2009; Lee et al., 2010; Kawesittisankhun & Pongpeng, 2019).

Conclusion and Recommendations

Current study contributed to growing body of knowledge theoretically, practically and methodologically with an additional evidence of moderating role of government policies, laws and Acts on relation among cultural factors and management of risks in Saudi Arabian construction sector. As practical perception, this study guides to escalate the risk management within KSA contractors. The current framework might establish benchmarking in managing performance based on construction risk management degree among KSA contractors serving as realistic motivation of transformation towards risks in KSA environment.

Cultural factors positively affect management of risks in Saudi Arabian construction industry. Government policies, laws and Acts positively affect management of risks in Saudi Arabian construction industry and government policies, laws and Acts positively moderate cultural factors on management of risks in Saudi Arabian construction industry.

GOVERNMENT POLICIES, LAWS AND ACTS

The contracts are culturally influenced and signed without proper documentation. The outcomes of this study improve the practices within negotiation, time, safety, communication, knowledge and human resource management. Lack of proper documentation in the contract grows the seed of misunderstanding and misconception among parties which are the results of neglecting cultural awareness.

The implication of current research assists strategic planners, establishments and scholars based on risk factors, model proposed and expansion of organisational control theory to befit contractors. Current research helps project team for project success to develop good culture within client, consultant and contractor, which makes project team members, construction and project manager towards project commitment.

For this study, quantitative cross-sectional research is employed. Data collection for current research is subjective which establishes a valid and reliable result for construction risk management. However subjective aspects result into various judgmental biases. Therefore, objective data collection is recommended for future aspect for fortification of results on construction risk management.

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Is War Just and Legal? An Ethical Review of the 'Just War' Theory

Ravichandran Moorthy and Lakshmy Naidu
University Kebangsaan Malaysia

The history of mankind is beleaguered with periodic wars between nations and groups that resulted in massive devastation of human lives, property, environment and civilizations. The Second World War, for one, was the most destructive war ever recorded. In its aftermath, many scholarly thinkers and leaders began intense debate on the 'legal and moral' justifications of war, its prevention and the promotion of the just-war theory as an essential norm that regulates conflicts between modern states and other international actors. The theory is based on the spirit of righteousness of conduct, responsibility, proportionality of actions and the active promotion of peacemaking among groups in conflict. The main argument of this paper is whether the concept of 'just war' is feasible to provide an ethical and legal framework to understand the relationships between humans, groups and states in managing conflicts. To discuss the main argument, the article is divided into three sections. The first section delves into the ethical and legal debate over what constitutes a just war, especially drawing from duty-based and utilitarianism perspectives. The second part examines the interactions between humans (as subjects) and states (as authority), particularly concerning the perceived centrality of the state. The third part examines how the just-war theory is adapted and manifested in the globalized and interdependent world.

***Keywords*:** Just war, Ethics, Peace, Conflict resolution, Justice

War is the oldest, most common, and most pressing issue in international security. Humans have only been at peace for 268 years out of the last 3,400, or about 8% of recorded history. At least 108 million people were killed in wars in the twentieth century. The total number of people killed in wars throughout history is estimated to be between 150 million and 1 billion (Hedges, 2003). War could be described as a planned and lengthy military conflict between political groups motivated by primary contention in matters of governance. The Second World War is the most horrific war in human history in terms of destruction of human lives and property (Gelven, 1994). This description is in line with the claim made by Von Clausewitz that war is "the continuation of policy by other means," as the enemies are compelled to act as intended through violence (Von Clausewitz, 1995). War is associated with the acceptable use of violence, instead of peaceful measures, to address or attempt specific strategies. Conflicts between distinct groups or communities are known as civil or ethnic conflicts. However, conflicts amongst non-political entities such as individuals or gangs are not categorized as war (Orend, 2008). Certain fractions can initiate wars against political communities or state as a means to attain strategic and defense aims. Terrorist groups aspire to become states or

influence states' development through violence (Moorthy, 2011). War disintegrates communities and families, as well as the socio-economic aspects of countries. Conflict causes long-term physical and psychological harm to children and adults. More people die and are disabled due to war than from any other cause. War also causes endemic poverty, starvation, disability, economic and social degradation, and mental disorder (Murthy & Lakshminarayana, 2006).

Realism is a long-standing international relations theory. It emphasizes the competitive and conflicting nature of international relations. Realists contend that the State is the most significant actor in global affairs and that survival of the state is of primary importance, with all actions geared toward ensuring survival. As such, the State's actions are judged by ethics of responsibility rather than moral principles. More recently, neo-realism or structural realism, a subset of realism, gained momentum to explain how states interact with one another and with other global actors. This theory emphasizes the importance of power politics in international relations, recognizes competition and conflict as permanent features, and sees limited scope for cooperation (Jervis, 1999). Countless modern wars fought in the last century were explained using Realist theories. The concept of statehood in realism is based on several fundamental principles; firstly, it asserts that states are the primary actor in international relations. The idea of centrality implores that all other actors are crucial, albeit secondary to the State. Secondly, states are tiered according to their power, typically measured in terms of military capabilities. According to the third principle, states conduct foreign policy to pursue their national interests. National interests are defined as the conservation of independence, territorial integrity, and control. Therefore, states will pursue their national interests by employing all optional strategies and utilizing all available measures, including war. The fourth principle asserts that state contention for power is enduring and pervasive (Moorthy, 2011; Moorthy & Sivapalan, 2010). Realism tends to advocate the use of force and war as the indisputable right of the state. Since the dawn of modern states, realism has significantly contributed to violent state behaviour. Realism became more scrutinized, especially at the end of the Cold War and with the ascendance of international systems.

To discuss this, the paper is divided into several sections. Section 2 explains the Just War Theory and its underlying principles. This is followed by a section on how just-war principles are manifested in relevant United Nations documents. The following section discusses the application of the just war principle in modern conflicts, specifically the conflicts in Palestine, Kashmir, and Afghanistan. First and foremost, these conflicts were chosen because they involved violent aggression by states and non-state actors for political and territorial reasons. Second, these conflicts have lasted for a long time and have resulted in significant tragedy for the local population, namely the destruction of lives and despair resulting from armed aggression. Third, foreign powers are involved in these conflicts, which exacerbates the situation and makes it more challenging to manage.

Just War Theory

Just war theory is concerned with justifying the reasons and conditions for initiating wars. Just war theory can be approached from a theoretical or historical perspective. The theoretical approach is interested in the moral reasoning for initiating

wars and the various kinds of warfare deployed. Meanwhile, the historical approach, known as the just war theory, examines the body of regulations or agreements used in different wars in the history of humankind (IEP, 2021). The moralistic justification of war was a hot topic in the post-World War II phase. As such, the post-war debacle on the good and bad of war emphasizes the immoral conflicts between state interests that are viewed as being narrow-minded and the fundamental human security fears culminating from the horrors of war. Therefore, it is not surprising that 'just war' principles are prevalent in post-war dialogues (Neff, 2005). The atrocities of wars have far-reaching effects on the immediate generation of victims and future generations. War memories are often invoked in historical writings and by politicians seeking to harness group support. For example, First World War (1914-18) and the Second World War (1939-1945) show no significant legal barriers that can dissuade states from fighting wars. Generally, wars not only impact the armed forces, the societies on both warring sides, but the economic, social well-being and the morale of the people are also equally affected. The impact of wars is extensive and often takes generations to heal (Moorthy, 2011; Moorthy et al., 2011).

While war is dreadful and undesirable, just war theory suggests that it is sometimes unavoidable in international affairs. The atrocious effects of wars and the immense social consequences they have raise a slew of troubling moral queries in the thoughts of any rational and considerate person (Cline, 2019). The just war theory's primary goal is to minimize the motivations for states to go to war by placing explicit moral norms, with the intention that these guidelines will significantly reduce the likelihood of military clashes. As a result, just war theory advocates ethics and helps in conflict resolution and peace promotion.

The just war theory, which evolved over many centuries, is the most prominent theory concerning the morality of war. It ascends based on the ideology of Catholic theologians such as Saint Augustine, Grotius, Suarez, Saint Aquinas, Vattel, and Vitoria. The origins of just war are a mixture of orthodox Greco-Roman and Christian values (Johnson & Weigal, 1991). The United Nations Charter, the Geneva Conventions, and the Universal Declaration of Human Rights are just a few international treaties and protocols that reflect the values and principles that arose from these traditions, both in spirit and as rules. These values and principles have influenced several other UN and multinational declarations.

Without a doubt, the just war theory has had a major effect on the legal and moral discourse surrounding war, particularly in the post-World War II period. This theory's premise is that war can be employed to mollify evil and promote goodness. The great debate over just war theory is centred on two conundrums. The first is about one's reasoning for fighting wars, especially when the war's very nature is anti-humanity. The second issue is determining whether some wars are morally superior to others. While these problems have been extensively contested over several decades, the theory presents many ethical principles to be observed by states before deciding to initiate war. Consequently, states that aim to engage in war will have to accept the responsibility to demonstrate that just war rules are adhered to. This theory seeks to dissuade conflict by

making it more complex for states to protect their option to engage in war if these principles are followed. The theory seems relevant and just, however not convenient to employ because of its intrinsic conceptual vagueness and inconsistencies with the state-centred value systems (Moorthy, 2011). The just-war theory is elaborated in three sections. Firstly, the jus ad bellum denotes the justifications provided by states for waging war. The second part, jus in bello, embodies justifiable acts initiated by states during the war. Whereas, jus post bellum, the third part, deals with justice issues in peace agreements and during the cessation period of war.

Principle of Jus Ad Bellum

The concept of "jus ad bellum" refers to the situation in which a state could initiate war or employ a defense force. The limitations in the use of violence by states and the exemptions are the fundamentals of jus ad Bellum, as specified in the United Nations Charter of 1945. "Jus ad bellum" controls the acts of entities engaged in armed conflict. It aims to reduce the suffering of war by protecting and aiding the victims to the fullest extent feasible (ICRC, 2015). The most fundamental concept stipulated by this theory is having a "just cause" for conducting war. Violence and conflict should be the last resort after all other choices have been considered, and only if there is a righteous cause. Even when war is waged, those who call for war usually justify their action by providing reasons for war. The declaration is made to justify the pursuit of war in defence of justice, freedom and against oppression. As a result, going to war becomes a 'just and moral' ground. Indeed, no state has ever specified that war is initiated for selfish and wicked causes. Wars are waged only when just reasons are present, and all conflict resolution efforts are exhausted. The usual 'just causes' often cited are self-defence from foreign threats, defence of innocent civilians and non-combatants from hostile regimes, and punitive measures for some grievous transgressions (Orend, 2008).

Well before the state may legitimize its decision to go to war, certain just war conditions must be met. Firstly, the motivations for war must be morally justified, the State must have the right purpose to initiate war, and secondly, the decision-making authority must be legitimate. War can only be waged when the decision is carried out following the proper process. Thirdly, states should explore other non-violent options to resolve the existing conflict before declaring a war. Diplomatic negotiations and third-party intervention are commons initiatives undertaken to bring warring parties to the negotiation process and seek mutually acceptable resolutions. Therefore, before opting for war, parties must consider all peaceful options for conflict mitigation. Fourthly, it suggests that the probability of success should be considered before going to war. States should refrain from war if it predicts that the objectives are unachievable, making war actions futile. Therefore, a country should not engage in a war that it cannot win. The fifth criterion is proportionality, which encourages governments to use good judgement when considering the universal benefit that might be expected from a choice to conduct war. The concept of universality is emphasized in the criterion since states frequently assess their predicted gains and costs, ignoring those going to the enemy (Cline, 2019).

Principle of Jus in Bello

The term ‘jus in bello’ discusses the moral restrictions on the acceptable and correct manners during a war of conflict. The premise is that after a war begins, international law can help determine its boundaries. These boundaries are manifested in the form of the jus in bello principle. It is the responsibility of states (by their military leadership) to defend this concept during times of war. History clearly shows that when war crimes happen and the jus in Bello principle is infringed, political leaders and military officials are impeached, such as in the cases presented in the International Criminal Court (ICC). This idea is divided into two parts: internal jus in Bello and external jus in Bello (Cline, 2019). The external jus in Bello delineates regulations to adhere to in war. It prohibits the use of weapons capable of causing widespread devastation, such as nuclear, chemical, and biological weapons. Soldiers must distinguish between combatant and non-combatant targets during military engagements. Third, according to the principle of proportionality, force may only be used in proportion to the goal being pursued. As a result, random bombings and the use of Weapons of Mass Destruction (WMD) are often considered as illegal military actions.

Fourth, the idea proposes compassionate quarantine for prisoners of war (POWs). As regulated by the Geneva Convention, POWs should be administered with proper treatments. When a soldier surrenders or is captured, they are no longer a threat. POWs should be treated with kindness, not malice. They should be moved to a secure location outside of the conflict zone. The fifth principle, Mala in Se, affirms that soldiers are not authorized to use weapons or malevolence, such as massacres, ethnic cleansing, poison and deceit, and biological and chemical toxins. The sixth principle is "no reprisal," which states that a government shall not react if an enemy state breaches its jus in Bello principle. The moral of this concept is that such retaliation may lead to an increase in atrocity and anguish. Internal jus in bello, on the other hand, refers to State responsibility, even though it may be at war, to protect the fundamental rights of its people.

Principle of Jus Post Bellum

Jus post Bellum is a principle that addresses the ethics of the post-war period, particularly the compulsion to reconstruct the country or territory (Orend, 2000). It is associated with the justice of peace treaties and the end-of-war phase. The end-of-war period entails changing from conflict to peace, which commonly raises many legal matters, particularly occupations and human rights. The just war theory could provide some moral options in coping with such challenges. The notion of "rights vindication" discusses that peace arrangements must also assure the fundamental rights of individuals who committed war crimes. The primary purpose of a peace agreement is to encourage remedial in the post-conflict phase. Peace settlements must not appear to be a means of retaliation, as this could rekindle old animosities amongst former adversaries. Based on the principle of jus post Bellum, the aggressor state should be punished proportionately. Political and military authorities who allowed human rights breaches to occur must be held accountable through a free and impartial international court. Everyone who has been involved in war crimes should be held responsible through the trial mechanisms in the post-war. According to the jus post Bellum principle, the vanquished state(s) should undergo a rehabilitation process to rid its society of unjust elements and maybe re-

institute structural reform. This step is essential for preventing the aggressor state from reverting to its prior behaviour. It can be argued that this stage may be the most contentious part of the Jus Post Bellum principle.

Just War Theory in the United Nations Documents

Infringements of human rights happen pre and post-conflict. The United Nations and its agencies are important institutions tasked with resolving international conflicts and disputes. The United Nations has been engaged in numerous peacekeeping operations in many conflict areas since 1948. All over the world, the United Nations has been involved in conflict prevention and mitigation efforts. Involvement in these measures through traditional diplomatic avenues can be discouraging and less valuable, particularly in internal conflicts. The UN has established many conflict prevention strategies to manage such conflicts, which include alleviating poverty, corrupt practices and disparities reduction, governance reform and institution development initiatives, and the reform of the security sector (Sriram, 2010). These include unmediated measures to reduce and eliminate more direct causes of violence, as well as attempting to address frictions before they escalate into high tensions (UN, 1945).

Since the United Nations has emerged as the fundamental actor in conflict resolution, Chapters VI and VII of the UN Charter have permitted the organization the power to conduct conflict mitigation measures. The primary responsibilities enshrined in these articles are carried out by the United Nations Security Council (UNSC). However, if required, the UN Security Council has the right to use force, but only after all other nonviolent choices have been utilized (Cline, 2019). The essence of human rights is incorporated in the UN Charter's preamble. The concept of a just war reveals itself in the establishment of international human rights treaties. After WWII, human rights statutes were included in UN human rights instruments. The international community made a significant move to laying the groundwork for an international human rights framework during the 1990s. It included the creation of the International Criminal Court which impeached criminals of war. The United Nations and its agencies became key institutions tasked with resolving international conflicts in the aftermath of WWII. Since 1948, the United Nations has been engaged in numerous peacekeeping efforts in many war-torn areas in the world. Due to the frameworks provided for conflict settlement, various wars and conflicts in the post-World War II period have been evaded. The UN Charter's preamble emphasizes human rights, as it states – “determined to reaffirm faith in fundamental human rights, in the dignity and worth of the human person, in the equal rights of men and women and of nations large and small” (UN, 1945).

The principle of just war is demonstrated in several UN documents. The UN Security Council (UNSC) is in charge of carrying out the UN Charter's core tasks. Article 33.2, for example, urges the parties to resolve their disagreement through peaceful efforts, and Article 34 permits the UNSC to examine any potential for international conflict. Article 39 can decide what actions should be adopted when there is a danger to peace and security. The Nuremberg Charter paved the way for acknowledging "crimes against humanity," particularly in wartime. Human rights laws and bills of guarantee were steadily integrated into UN human rights documents such as the Universal

Declaration of Human Rights (UDHR). Although UDHR is a non-legally binding document, member countries overwhelmingly supported it in the General Assembly. The support displays the significance of human rights to the global society.

Is Just War Theory Relevant to Modern Conflicts?

Some believe that the just war theory is fundamentally immoral, while others argue that ethics has no role in war and does not apply in modern conflict situations. Opponents of this theory believe that all wars cause violence and suffering. Since this theory allows for specified amounts of violence, it is unjust and immoral, and cannot be considered a component of any ethical theory. They argue that, while just war aims to make it harder for nations to initiate war, the decision to wage war is usually determined by the states' realist considerations and relative military power rather than ethics. War and conflict disrupt societal norms of friendship, peaceful living and coexistence. In conflicts, these norms are infringed and therefore, become immoral.

Whereas, the supporters of this theory claim that there are several conflict resolution properties in this theory. For example, as parties in conflicts respect the culture, traditions, and the law of the defeated party, it facilitates confidence-building and help prevent future conflicts. The theory also urges parties to take serious initiatives to protect the war victims and their property, and avoid any excesses of war by eliminating any form of reprisal in the post-conflict period. The theory also proposes that even war is governed by principles and rules, and these must be adhered to strictly by all parties. Since war involves power-play between states, the theory argues that there should be moral integrity to exercise these powers. The cornerstones of decision making regarding the use of authority and force should be moral and ethical judgments. In essence, this theory upholds human pride as the core quest of this theory. We discuss how the just-war theory manifests itself in several conflicts around the world, including those in Palestine, Jammu and Kashmir, and Afghanistan, in sub-sections 4.1-4.3. Using the case-study method, the article investigates how just war principles manifest and develop in these conflicts. This method attempts to comprehend and explain broader and more general underlying dynamics by emphasizing one or a few case studies.

The Palestine Conflict

The Israeli–Palestinian conflict is one of humankind's most prolonged conflicts, with the occupation of the West Bank and Gaza Strip by Israeli forces for almost six decades. Despite numerous attempts to resolve the conflict as part of the Israeli–Palestinian peace process, all of them have failed. This protracted conflict has resulted in violence and misery, particularly among the Palestinian people. The primary questions arising from the ongoing conflict in Palestine revolve on whether the warring factions' responses are consistent with the principles of just war, and if those responses are based on distinct understandings of natural law, justice, and sovereignty. The military occupation of territories has necessitated the development of new perspectives on the theory of just war. The politicization and weaponization are manifested by sporadic acts of open violence, either by Palestinian radicals opposing military takeover or by the Israeli forces defending its settlements. (Asad, 2010). By weaponizing the institutional order of these territories, each group try to assert their respective political legitimacy.

There are different perspectives on this conflict. One view argues Israel's occupation of the territories mostly conforms to international norms, based on justified moral and legal grounds, albeit acts of violations (Kuo, 2008). Interestingly, these acts of oppression and occupation are within the structure of peace-war. Another perspective is Israel as an illegal occupier of Palestinian land and perpetuates aggression and suppression in Palestinian society. As a result, there is a need to reexamine the concept of force enshrined in just war theory from the standpoint of peace research. This reframe is necessary because the use of violence is sanctioned in the modern international system to defend existing sovereignty, not to dissolve or expand it. In the case of the Israel-Palestine conflict, military and police enforcement are critical because the occupations fall somewhere between interstate war and civil unrest. According to the just war theory, occupation and violence are legal because they enable Israeli forces to regain total security of the territories (Williams, 2012). However, rules of war must be imposed to provide legal justification for killing and destruction. In the midst of both sides' hostilities, the theory must address moral guidance to capture the complexities of force and power in conflict.

However, rules of war must be imposed to provide legal justification for killing and destruction. In the midst of both sides' hostilities, the theory must address moral guidance to capture the complexities of force and power in conflict. It can be argued that the Palestinian attacks on Israeli civilians may be predicated on different moral assumptions. Likewise, the same argument applies to the atrocities committed by the Israeli forces on the Palestine civilian population. On the other hand, the Israeli government justified excessive military force against protesting civilians, claiming that invasions were required to prevent Palestinian militants from killing Israeli civilians (McMahan, 2016). The infringement of *jus in bello* principle of the just war theory is apparent as it does not motivate either party to adopt moral judgment about war that could minimize war-time killing. Furthermore, Israel's pursuit of development that violates Palestinian territorial and sovereign rights may be interpreted as undermining jus post bellum measures. This could lead to even more oppressive and defensive actions on both sides in the future, further delaying any peace efforts. Even though both parties are fighting for just causes, it is clear that the conflict is subject to moral and ethical constraints and judgments.

Considering the complexity of territorial war and annexation, the authors propose that the principles of just war consider the context of the situation that is being judged. Factual context, such as the series of acts leading up to the attacks, the incentives of the fractions involved, and which party initiated hostilities, are critical in forming a complete perspective of the ethics, defense, and strategic environment. (Steele, 2011). Analysts might be able to establish an integrative evaluation of the exclusive truth of occupation if they had a broader perspective on these dimensions. Understanding and evaluating situations from multi-dimensional views can potentially reduce ethical and moral ambiguity that has emerged from this unique nature of occupation.

Kashmir Conflict

The Kashmir conflict is a territorial dispute over the Kashmir region between India and Pakistan, and China as a third party. The conflict has resulted in three wars between India and Pakistan, and several numerous other armed clashes over the decades. The disputed Jammu and Kashmir region is one of the world's most militarized conflict zones. The presence of military and paramilitary forces in the region has only served to threaten the region by inciting tension and violence. The conflict continues to strain the country's bilateral relations with these neighbours (Mukherjee, 2014). Some of the security issues that have engulfed the disputed territory include violations of human rights on both sides, terrorist cells linked to Al Qaeda, and India and Pakistan's nuclear capabilities.

The next question – "Is the act of aggression in Kashmir just and follow the just war principles?" From Pakistan's perspective, the aggression perpetrated by the rebels is viewed as a freedom movement to liberate the land from 'foreign' aggressors. As such, the use of violence is justified as it serves the military objective of expelling invaders from an illegal invasion. The principle of 'proportionality in war' does not apply because these invaders are seen as evil aggressors seeking to uproot the local residents and change their way of life and beliefs, making it into a religious pursuit. For India, the Kashmir issue is an internal matter, and the foreign aided uprising in the region is seen as foreign encroachment into Indian internal affairs and a direct challenge to its sovereignty. As such, the use of just war principles has limited utility as it faces challenges from non-state actors.

From an international law perspective, any form of infringement of Kashmir's sovereignty is a breach of the UN Resolutions and the Shimla Declaration. Both countries may invoke the law to resort to force (*jus ad bellum*), the law on the conduct of hostilities and war (*jus in bello*) and the international human rights law to expose the atrocities committed against the people of Jammu and Kashmir (IPS, 2020). Further, the principle of *jus post bellum* here aims to provide moral guidance on the responsibilities of various actors in the aftermath of conflict. In the case of Kashmir conflict, structures such as truth commissions (to address the issues of reparation and transitional justice), construction of peace treaties (well-thought-out plans for the promotion of durable peace and confidence-building measures among the people and the warring factions), and reconciliation of states (mainly the primary stakeholders - India and Pakistan). In summary, the theory of just war entails addressing the actual elements of the conflict, which entails attempting to achieve justice, truth, peace, mercy, and, eventually, reconciliation (Lederach, 1997).

Afghanistan Conflict

The Afghan conflict is a protracted one over several decades. The Afghan War in 1978-89 began with internal conflict between anti-communist Islamic guerrillas and the Afghan communist government (backed by Soviet troops), leading to the government's overthrow in 1992. However, the conflict analyzed in this paper is the conflict arising from the US invasion of Afghanistan of 20 years ago in response to terrorism and radicalization. This section discusses the relevance of the principles of just war theory in the Afghan conflict. The attack on Afghanistan was based on Article 51 of

the UN Charter, which provides countries with the right of self-defense, including collective self-defense, in an armed attack. The US accused Afghanistan of harbouring and supporting terrorist elements within its borders, and on the attack on the World Trade Center twin towers in New York on 11 September 2001. As such, the US views its military response in Afghanistan as an act of self-defense. The US justified its invasion of Afghanistan by citing fears of similar deadly attacks in the future and the desire to pursue al-Qaeda, the terrorists accountable for the attacks. Occupation of any sovereign state by another State is impermissible under international law and norms. However, the US used diplomacy and the global system to get the endorsement to intervene.

Nevertheless, some scholars have argued that using violent measures against Afghanistan was not legal because simply harbouring terrorists does not rationalize the use of violence under Article 51 (Scholtz, 2004). According to Article 51, self-defense must be directed against the state, which was accountable for the armed attack if the territorial independence of that state is breached. Hence, US actions in Afghanistan have jeopardized its right as a State that has been attacked by terrorists to respond in self-defense against any State 'harbouring' them (Ratner, 2015). Furthermore, the US launched a military attack in Afghanistan despite other countries' insistence on Security Council authorization under Chapter VII. This has called into question the legality of the use of force. Consequently, the United States (US) and its coalition partners have violated jus ad bellum.

However, the US has stated its commitment to reducing human casualties and harm to civilian property since the inception of the conflict. As a fundamental principle of humanitarian law, the commitment supports certain basic jus in bello norms, such as the protection of civilians and prisoners of war. Despite this commitment, some civilians, not connected to any terrorist groups, were victims of US attacks. The US had to take the responsibility by expressing regret over such incidents. Further, the US also faced challenges regarding the treatment of prisoners of war, for not following the principles of *jus in bello* – responsibilities during war or conflict. A 'prisoner of war' is a non-combatant and that individual must not be subjected to any form of harassment or torture during captivity. According to the US, since these terrorist groups cannot claim statehood, principles enshrined in international treaties such as the Geneva Convention and Protection of Prisoners of War do not apply (Whitehouse, 2002).

The long-term consequences of the use of force require the US to incorporate and implement the principle of *just post bellum* in the post-conflict phase. Further to the legality of the Fourth Geneva Convention of 1949 (concerning the protection of civilian persons in time of war), and the Hague Convention IV of 1907 (respecting the laws and customs of war on land), the *post bellum* activities should be directed based on ethical reasoning. The post-conflict reconstruction is viewed as a military necessity and therefore, requires careful planning. Groundwork done with adequate diligence and due ethical consideration can restore order, heal hostilities, rebuild infrastructure, reestablish societal institutions and restore the environment. All these measures are undertaken regarding the legitimacy of the peace that follows after the conflict. Ideally, all personnel involved in the conflict should be well-trained in the *post bellum* operations. However,

American military personnel have demonstrated less involvement in highly perceptive and specialized *post bellum* situations in Afghanistan (Iasiello, 2004).

Conclusion

The persistent issue revolves on whether the just war theory, which is incorporated into UN documents, is adequate to prevent states from going to war with one another. The number of wars and conflicts in the post-World War II period has dramatically decreased. However, state warfare has been supplanted by conflicts initiated by non-state actors. The quantity and seriousness of attacks and conflicts by terrorists and civil unrest have amplified in recent years. Thousands of people have perished due to these attacks and conflicts, globally. For example, thousands of people have died in the ethnic strife in Sri Lanka, and the ethnic-cleansing massacre in the former Balkans and Sudan. Often, socially, economically, and politically disadvantaged and marginalized groups may openly express their dissatisfaction and engage in violent actions against other groups or even the State. The just war theory focuses on preventing states from initiating wars, but it appears insufficient and unsuccessful to lessen conflict among non-state warring parties. Non-state actors are not entities to international agreements on war and conflicts, and international rules of engagement. The just war theory has assisted in the administration of state wars, but it does not have the legality and authority to be adapted in non-traditional wars. The ethical dilemma we face is how to apply this idea to contemporary situations. The application of just war theory to non-conventional wars has numerous structural challenges.

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Do Humanity Student New Needs Meet the State Decisions of Distance Learning during the COVID-19 Epidemic in Ukraine?

Valery Okulich-Kazarin
National Louis University, Poland

Yuliia Bokhonkova
Volodymyr Dahl East Ukrainian National University, Ukraine

Viktoriia Ruda
Lugansk State Medical University, Ukraine

This study aims to verify do the humanity student new needs meet the State decisions of distance learning in distance learning during COVID-19 epidemic in Ukraine. It was used the research methods: general scientific research methods; study of official documents and scientific resources; statistical methods, including verification of statistical hypotheses. It was 77 students of humanity specialities. Verification of statistical hypotheses led to the Alternative hypothesis. The principal result is that the humanity student new needs in distance learning do not meet the state decisions of distance learning related to the COVID-19 epidemic in Ukraine. The result is highly statistically significant (99.0%). The major conclusions are: 1) the state decisions of student health are distance learning in the amount of 100%; 2) the humanity student new needs in distance learning are 25.00% - 46.25%; 3) this amount is less than it was just before the pandemic came (54.20% - 68.66%). The new scientific knowledge has important practical and theoretical significance. The authors prepared some multi-level recommendations about distance learning during the COVID-19 epidemic for Ukrainian authority and universities. This study is helpful for higher education institutions who use distance learning .

***Keywords*:** humanity student, student educational needs, distance learning, Ukrainian student, the COVID-19 epidemic

Distance learning became very important because our civilization met with the COVID-19 epidemic (WHO, 2020). And many universities were forced to stop studying. Later, they started using distance learning at a rate of 100%. Since Ukrainian universities have not used distance learning before, they have faced theoretical and practical problems. Our research is empirical in nature. The authors did not deal with the theory of distance learning (Sutton et al, 1995). They studied the humanity student new needs in distance learning during COVID-19 epidemic.

Correspondence concerning this article should be addressed to Dr. Valery Okulich-Kazarin, National Louis University, Poland, Emial: v-kazarin@yandex.ru

The first study used by authors was the empirical study (Mahmudah et al., 2021), published earlier. The cited research studied home learning model and education innovation in the terms of the COVID-19 pandemic. The next study (Zhurba et al., 2021) showed that the needs of Ukrainian students in distance learning were in the amount of 43% just before the start of the Covid-19 pandemic. The paper (Zhurba et al., 2021) showed that the decision of the Ukrainian authorities to use distance learning in the amount of 100% did not meet the educational needs of students when the COVID-19 pandemic has started.

Our study continues this important topic of distance learning of humanity students in Ukraine. The authors investigated the new level of student educational needs in relation to distance learning, formed during the COVID-19 pandemic. On the one hand, students studied distantly for a year and a half. And these one and a half years they felt moral discomfort. This discomfort is associated both with the unwillingness to study distantly, and with the authorities ignoring their needs.

The situation is complicated by the fact that in the countries of Eastern Europe, students are not subjects of the educational services (Okulich-Kazarin, 2020). Therefore, the Ukrainian authorities do not coordinate their decisions of student community health with the student educational needs in distance learning.

Thus, state decisions of student health care ignore the needs of students twice. For the first time, state decisions ignored the needs of students in distance learning (Zhurba et al., 2021). For the second time, the first state decisions ignored the needs of students for respect (Maslow, 1954). According to (Maslow, 1954), dissatisfaction of needs leads to a feeling of additional discomfort.

The lack of satisfaction of these needs leads to the blocking of a higher-level need - a cognitive need. This, in turn, reduces the quality of education and again adds moral discomfort. Thus, a simple state decision on distance learning of students in the amount of 100% is not the only correct decision. This decision has a negative consequence in the form of deterioration of student health. On the other hand, a year and a half of distance learning should have led to the adaptation of students to distance learning. It is possible that the new needs of students in distance learning coincide with the state decisions on distance learning 100% and students have stopped feeling moral discomfort. Based on the above, it is very important to investigate the new level of student educational needs in relation to distance education, formed during the COVID-19 pandemic. Firstly, we mean humanity students.

The results are important for Ukrainian authorities, university leaders and scientists. They are also important for authorities, university leaders and scientists of other countries who deals with education quality and student health.

Literary review

Some negative consequences for student health when students use distance learning

The authors of the article (Hasanuddin et al., 2021) are sure that COVID-19 pandemic time is a big problem for education. Almost the whole world was affected by the "Study From Home policy" during the Covid-19 Pandemic (Nurulfa et al., 2021).

The authors of the article (Cooper et al., 2021) write that loneliness is a common phenomenon in adolescence and is associated with a number of mental health problems. Such feelings may have been reinforced by the social distancing measures introduced during the COVID-19 pandemic. The authors further examined the transverse associations and longitudinal relationships between loneliness, social contacts and relationships with parents and subsequent mental health. Adolescents who reported higher loneliness had higher symptoms of mental health problems during the pandemic (Cooper et al., 2021).

There were 432 respondents interviewed in the paper (Nurulfa et al., 2021). 30.79% of them reported: "I have difficulty learning concentration during online learning". And 34.03% reported that "I feel dizzy when staring at my laptop/computer or cellphone for a long time" (Nurulfa et al., 2021).

Moreover, distance learning in amount of 100% impacts negatively on mental health of students. The survey by Young Minds shows that 83% of young respondents agreed that the COVID-19 pandemic worsened pre-existing mental health conditions. The main reason is education institutes were closured and social communications were restricted (Grubic et al., 2020).

The author of the article (Kanzow et al., 2021) claims that during the COVID-19 pandemic, entrance to universities was restricted for students. Thus, the use of distance learning in the amount of 100% increases the feeling of loneliness among students. Finally, the article (Zhurba et al., 2021) approves that the sudden transition to 100% of distance learning can affect the mental and physical health of students. So, we have no reason to doubt the importance of our study. Several reputable scientists prove the negative impact of 100% distance learning on the mental health of students. The authors would like to contribute to improving the student health care through our study and some recommendations.

Theoretical brief about humanity students

About sixty years ago, the famous English writer and philosopher Charles Snow read the report "Two Cultures" (Snow, 1963), in which he expressed reasonable fears that representatives of the humanitarian sciences understand representatives of the natural sciences worse and worse.

In post-communist science, it is customary to divide academic subjects into three profiles (Samygin, 1998; Slastenin et al., 2002):

- Technical profile.

- Natural profile.
- Humanitarian (humanity) profile.

From a theoretical point of view (Samygin, 1998), the complexity of the problem lies in the different structure of the mental abilities of people with a tendency to technical, natural and humanitarian specialties. Since traditional lectures are based on the auditory method of teaching (Kayalar & Kayalar, 2017), at first glance, there will be no problems with "humanities" at traditional lectures.

They, humanity students, constantly live "in the world of words" (Samygin, 1998; Slastenin et al., 2002). Humanity students are good at remembering what they hear when they assimilate information with the help of an auditory representation. And face-to-face method of training should be quite comfortable for them.

In our study, the preferences of humanity students in relation to the distance teaching method were evaluated. The authors believe that from a theoretical point of view, the distance learning method should not be comfortable enough for humanity students.

From a theoretical point of view, the humanity students should suffer more than students of other profiles concerning of distance learning in the amount of 100%. It is more difficult for them to psychologically adapt to the terms of limited contacts and direct communications. The feeling of loneliness should have a negative impact on their moral state. This can be expressed in a feeling of anxiety, fear, uncertainty. In the end, these are a student health problem. It was the authors' decision to start a study with humanity students. This decision was reflected in the research question, the purpose of the study, the key hypothesis and the sample of respondents.

State decisions of distance learning related to student health care during COVID-19 pandemic in Ukraine

The Coronavirus disease has appeared in December 2019 (Li et al., 2020). Soon the World Health Organization has declared a pandemic (WHO, 2020). The pandemic Covid-19 strongly impacts the health of every of us (Xing et al., 2020).The actions of the Ukrainian authorities included two decisive steps concerning educational institutions. At the first step, starting since March 12, all educational institutions were closed for quarantine purposes (Government decision, 2020). The heads and teachers of educational institutions were ordered to start distance learning. At the second step, the quarantine was extended since March 26 till April 24 (Two scenarios, 2020). Since March 26, all 100% of classes have been held in the form of distance learning.

Again Ukrainian universities have started distance learning related with COVID-19 from October 12, 2020 (Ukrainian universities, 2020). Since January 8, 2021, new strict quarantine restrictions have begun to operate (Tightening of quarantine, 2021). Now students even have to pass the session remotely. The Minister of Health of Ukraine Lyashko (2021) said that a new lockdown may be started in the fall of 2021.Thus, responding to the threat of COVID-19, the Ukrainian authorities have increased the share of distance learning to 100%. These decisions were made in order to take care of the

health of students. Therefore, the study of the needs of Ukrainian students in distance learning has practical and theoretical significance.

Method

Total Information

Our study was carried out since April 2021 till November 2021 in Ukraine. It was used these research methods:

- general scientific research methods (methods of analysis and synthesis, induction and deduction);
- study of official documents and scientific resources;
- statistical methods, including verification of statistical hypotheses (Singpurwalla, 2015).

The research question was do humanity student new needs meet the state decisions of distance learning during COVID-19 epidemic in Ukraine? The subject of the study is: relationship of the humanity student new needs in distance learning and the state decisions of distance learning during COVID-19 epidemic in Ukraine. The aim of the empirical study is to verify do the humanity student new needs meet the State decisions of distance learning in distance learning during COVID-19 epidemic in Ukraine.

Research Hypothesis

A couple of statistical hypotheses were created for the verification (Singpurwalla, 2015).

The Null hypothesis: the unknown mean for the humanity student new needs in distance learning is equal to 100%, if random deviations are not taken into account.

The Null hypothesis is written: $\mu_0 = 100.00\%$.

The Alternative hypothesis: the unknown mean for the humanity student new needs in distance learning is not equal to 100%, if random deviations are not taken into account.

The Alternative hypothesis is written: $\mu_0 \neq 100.00\%$.

Why the Null hypothesis claims that the unknown mean for the humanity student new needs in distance learning is equal to 100%?

The method of hypothesis testing about the average general population is to calculate t-statistics (BUS_9641_5M, 2010; Singpurwalla, 2015).

The authors understand that in reality it is almost impossible to have such a value. In our case, the authors accepted $\mu_0 = 100.00\%$, since the Ukrainian authorities have increased the share of distance learning to 100%.

Plan of the study

The study was carried out in the four steps:

1. The literature review was the first step. Here, the authors studied negative consequences for student health when they use distance learning. Also, relevant scientific literature and legal acts of the authority of Ukraine related to distance learning and the student health during COVID-19 pandemic were studied. Finally, the authors made theoretical brief about humanity students.

At this step, more than 100 scientific sources were thoroughly studied. Among

them there were some articles published in Journals indexed in the Scopus database.

2. The second step was to create a question for questioning students. The question was: "What share of distance learning do you need today?".

3. At the third step, the authors drew up an experiment plan and interviewed the students in accordance with the book (Singpurwalla, 2015). The survey scheme included the following groups of humanity students:

- first-year students who have only distance learning experience and senior students who have studied both remotely and in classrooms,
- humanity students of Bachelor and Master degrees,
- university students and college students.

All students were full-time students, since part-time students spend less time together studying in classrooms.

There were a total of 77 respondents.

4. Finally, the authors made a statistical processing of the results, including verification of statistical hypotheses in accordance with the book (Singpurwalla, 2015). Also it was used the verification of statistical hypotheses with nonparametric test (BUS_9641_5M, 2010).

After discussions, the authors formulated the Conclusions and recommendations.

Thus, we have performed an excellent multi-sided study.

Respondents

The serial (nested) sampling (Kravchenko, 2014) was used for the experiment. The authors tried to achieve the maximum diversity of students by gender, age and geographical region. The study involved humanity students from the National University "Odessa Law Academy", State Institution "Luhansk Taras Shevchenko National University" and the Dnipro Professional Pedagogical College of the Kommunal institution of higher education "Dnipro academy of continuing education" of Dnipropetrovsk regional council. So, there were students of East, Central and South regions of Ukraine in the study. All students were surveyed in May-July 2021. Participation of students in the study was voluntary, and authors didn't offer any compensation to students.

In the study, humanity students from the following groups were interviewed:

- first-year students who have only distance learning experience and senior and master students who have studied both remotely and in classrooms,
- humanity students of Bachelor and Master degrees,
- university students and college students.

Our study has five elements:

1. We investigated the student educational needs in distance learning. That is, we have measured the current educational needs of students in distance learning.

2. We studied only students of the humanities profile.

3. We interviewed both kind of students as college students as university students.

4. We interviewed first-year students who have no experience of studying in classrooms and lecture halls. First-year students have only distance learning experience. And distance learning is the only possible norm for them.

5. We interviewed senior students. These students have experience of studying in classrooms, without distance learning.

DECISIONS OF DISTANCE LEARNING

The general characteristics of the respondents are given in Table 1. The data in Table 1 is available after the rejection of inaccurate answers.

Table 1

General characteristics of the respondents, 2021

No	Indicator	Sum	University
1	Management, Bachelor, 1 year	6	Odessa Law Academy
2	Management, Bachelor, 2 year	6	
3	Social work, Master, 2 year	6	Luhansk Taras Shevchenko
4	Social work, Bachelor, 2-4 year	10	National University
5	Social work, Bachelor, 1 year	6	
6	Primary education, Bachelor, 3 year	27	Dnipro Professional
7	Primary education, Bachelor, 1 year	16	Pedagogical College
	Total	77	

Source: own data

Table 1 shows that a good range of humanity students from three regions of Ukraine is presented. In total, there were 77 participants in 7 groups in the study. The number of respondents is from 6 to 27 in the groups.

In the ascertaining and formative pedagogical experiment, it is traditionally considered that the number of respondents equal to 6 is a small number for comparison. At the same time, the theory of statistics and statistical Table 9.1.1 (BUS_9641_5M, 2010) make it possible to compare small groups of 2-3 persons with a given significance level. The lower limit of the number of respondents in the group was chosen to be 6 based on the rate of change of the critical value t_{table} (BUS_9641_5M, 2010). For example, the study (Kayalar & Kayalar, 2017) was carried out with 15 respondents.

The use of statistical methods allows us to extend the results obtained to the whole general population of humanity students of Ukraine. This can be done with a controlled probability.

Results

Statistical processing of questionnaires

Then the authors performed the initial processing of the questionnaires. These were calculated statistical indicators (Table 2) for each group of humanity students:

- the expected value ($\dot{X}$),
- the average for the sample (δ_x), and
- the average for the population (δ_{x-1}).

Table 2

Statistical indicators, 2021

No	Indicator	$\dot{X}$	δ_x	δ_{x-1}
1	Management, Bachelor, 1 year	26.25	6.49	7.50
2	Management, Bachelor, 2 year	30.00	18.25	20.00
3	Social work, Master, 2 year	46.25	19.16	22.13
4	Social work, Bachelor, 2-4 year	25.00	6.70	7.07

5	Social work, Bachelor, 1 year	26.00	4.89	5.47
6	Primary education, Bachelor, 3 year	45.96	26.81	27.35
7	Primary education, Bachelor, 1 year	25.66	21.82	22.58

Source: obtained from primary data

Table 2 shows the expected value ($\dot{X}$) for various groups of humanity students. For first-year Bachelor students, $\dot{X}$ is in the range of 25.66 - 26.25 for both university students and college students. For senior students, $\dot{X}$ is 25.00 and 30.00 for university students. And for master students $\dot{X}$ there is 46.25. This is higher than for university senior students.

For senior students $\dot{X}$ is 45.96 for college students. This is higher than for university senior students. Table 2 shows that the need in distance learning is minimal for first-year students compared to senior and master students. At the same time, Table 2 shows that X is less than 100%. However, we cannot say whether the difference between X and 100% is the result of random deviations? Or should this difference be explained by other reasons? In other words, we have no scientific proof that the humanity student new needs in distance learning meet the state decisions of distance learning during COVID-19 epidemic in Ukraine. So, the purpose of the next stage is to test the Null hypothesis: the humanity student new needs in distance learning meet the state decisions of distance learning during COVID-19 epidemic in Ukraine. In subsection 3 of the section "Literary review" it was shown that the Ukrainian authorities have increased the share of distance learning to 100%. Given this proven fact, the Null hypothesis sounds like this (Singpurwalla, 2015): the unknown mean for the general population of humanity students is equal to 100%. Here we are talking about the humanity student need in distance learning.

The Verification of Statistical Hypotheses: the unknown mean of the humanity student new needs in distance learning is equal 100%

The verification of the Null hypothesis gives us new objective research knowledge about the relationship of the humanity student new needs in distance learning and the state decisions of public health within student community in Ukraine. The acceptance of the Null hypothesis means that the humanity student new needs in distance learning meet the state decisions of distance learning related to student health care. The acceptance of the Alternative hypothesis means that the humanity student new needs in distance learning do not meet the state decisions of distance learning related to student health care. Taking into account the composition of respondents, the authors tested statistical hypotheses separately for the first-year Bachelor students and for the senior and master students. The first of them studied distantly from the very beginning. They have no face-to-face training experience. The second of them have both distance learning and face-to-face training experience.

The verification of statistical hypotheses for the first-year Bachelor students

The first-year Bachelor students are in groups No 1, No 5 and No 7.

Table 3 shows the results of the verification of statistical hypotheses.

Table 3

The verification of statistical hypotheses for the first-year Bachelor students. The significance level is 99.0%

No	Indicator	Gr-1	Gr-5	Gr-7
1	Sample size, n	6	6	16
2	Average of sample, $\dot{X}$	26.25	26.00	25.66
3	Standard deviation for sample, $\boldsymbol{\delta_x}$	6.49	4.89	21.82
4	Average error, $\dot{S}_{\dot{X}} = \boldsymbol{\delta_x} / \sqrt{n}$	2.65	1.99	5.46
5	Value $\mid t_{stat} \mid$ for $\mu_0 = 100.0$, $(\dot{X} - \mu_0) / \dot{S}_{\dot{X}}$	27.83	37.19	13,62
6	Value t_{tabl} for significance level 99.0%	4.032	4.032	2.947
7	Result, $\mid t_{stat} \mid > t_{tabl}$	Yes	Yes	Yes

Source: obtained from primary data

If in Table 3, t-statistics $\mid t_{stat} \mid$ is larger than the t_{tabl}, so the authors reject the Null hypothesis. And they accept the Alternative hypothesis: the unknown mean for the humanity student new needs in distance learning is not equal to 100%, if random deviations are not taken into account. The fixed difference of the statistical average $\dot{X}$ and the specified value (μ_0=100.0) can not be explained by randomness only (Singpurwalla, 2015). This means that the humanity student new needs in distance learning do not meet the state decisions of distance learning related to student health care. We are talking about the first-year Bachelor students new needs in distance learning.

The verification of statistical hypotheses for the senior and master students

The senior and master students are in groups No 2, No 3, No 4 and No 6.

Table 4 shows the results of the verification of statistical hypotheses.

Table 4

The verification of statistical hypotheses for the senior and master students. The significance level is 99.0%

No	Indicator	Gr-2	Gr-3	Gr-4	Gr-6
1	Sample size, n	6	6	10	27
2	Average of sample, $\dot{X}$	30.00	46.25	25.00	45.96
3	Standard deviation for sample, $\boldsymbol{\delta_x}$	18.25	19.16	6.70	26.81
4	Average error, $\dot{S}_{\dot{X}} = \boldsymbol{\delta_x} / \sqrt{n}$	7.45	6.61	2.11	5.16
5	Value $\mid t_{stat} \mid$ for $\mu_0 = 100.0$, $(\dot{X} - \mu_0)/\dot{S}_{\dot{X}}$	9.39	8.13	35.54	10.68
6	Value t_{tabl} for significance level 99.0%	4.032	4.032	3.250	2.779
7	Result, $\mid t_{stat} \mid > t_{tabl}$	Yes	Yes	Yes	Yes

Source: obtained from primary data

If in Table 4, t-statistics $\mid t_{stat} \mid$ is larger than the t_{tabl}, so the authors reject the Null hypothesis. And they accept the Alternative hypothesis: the unknown mean for the humanity student new needs in distance learning is not equal to 100%, if random deviations are not taken into account. The fixed difference of the statistical average $\dot{X}$ and the specified value (μ_0=100.0) can not be explained by randomness only (Singpurwalla, 2015). This means that the humanity student new needs in distance learning do not meet the state decisions of distance learning related to student health care. We are talking

about the senior and master students new needs in distance learning. Thus, we note that the new needs in distance learning of all the surveyed students are not equal to 100%. That is, the humanity student new needs in distance learning do not meet the state decisions of distance learning related to student health care in Ukraine.

The obtained result is highly statistically significant (99.0%).

Verification of statistical hypotheses with nonparametric test

The analysis performed in paired data by nonparametric procedure. It was using the sign test on the differences (BUS_9641_5M, 2010). The Null Hypothesis claims that just as many units go up (comparing the students' needs values X and the share of distance learning concerning of Ukrainian authority decision Y) as down in the population. Any net movement up or down in the sample would just be random under this hypothesis. The difference is not statistically significant. In accordance with the Null hypothesis, the movement of the students' needs and the share of distance learning up or down happen by chance.

The Alternative Hypothesis claims that the probabilities of going up and down are different. The difference is statistically significant. In accordance with the Alternative hypothesis, the movement of the students' needs and the share of distance learning up or down happen not by chance.

The procedure of statistical hypothesis testing:

1. We built a new Table 5. A new dataset is created in this table.

Table 5 shows the data for the statistical analysis in the two paired samples.

A column "X" contains the students' needs values. A column "Y" contains the value for the share of distance learning concerning of Ukrainian authority decision.

Table 5

The Data is for statistical analysis: it was using the sign test on the differences

	Gr-1	Gr-2	Gr-3	Gr-4	Gr-5	Gr-6	Gr-7
X	26.25	30.00	46.25	25.00	26.00	45.96	25.66
Y	100.00	100.00	100.00	100.00	100.00	100.00	100.00
X – Y	minus	minus	minus	minus	minus	minus	minus

Source: obtained from primary data

2. The modified sample contains indicators that have differences only (see Table 3). The modified simple size is m = 7. A column "X-Y" contains the difference between values. The sign "minus" in the column "X-Y" represents the difference of the students' needs values X and the share of distance learning concerning of Ukrainian authority decision Y. The Table 3 shows that the number of indicators that is negative (the value in the string "X-Y" is "minus") is 7 units.

3. The limits for the "sign test" are 1 and 6 for m = 7 and at the level of hypothesis testing 5% - see Table 16.1.1 (BUS_9641_5M, 2010).

4. Since the number 7 falls outside the limits (i.e. it is more than 6) we reject the Null Hypothesis and conclude that the result is statistically significant. We accept the Alternative Hypothesis. The students' needs is significantly different from the share of distance learning concerning of Ukrainian authority decision.

The result is statistically significant (5%). So, the verification of statistical

hypotheses with nonparametric test showed the same result as the method of hypothesis testing by calculation t-statistics.

Discussion

What new results have we got?

First, the authors studied the new needs of students in distance learning. This new needs for humanity students were formed during the COVID-19 pandemic. It is proved statistically that the humanity student new needs in distance learning do not meet the state decisions of distance learning during the COVID-19 pandemic. It is a real problem of distance learning during the COVID-19 pandemic in Ukraine from two points of view. The first point is the student health. The second one is a quality of higher education. The education system is the main factor of updating of tenor of life of the state and further development of democratic institutes (Belentsov et al., 2017). Therefore, this problem of distance learning should be solved at the level of the authority and universities of Ukraine.

The authority and universities of Ukraine should take measures to meet their decisions of 100% distance learning with the new needs of humanity students. Second, we note that the new needs in distance learning is minimal for the first-year students compared to the senior and master students. This can be explained by the fact that the first-year humanity students do not have any experience of studying in classrooms. Their need in distance learning is about 25%. They do not feel very comfortable in the amount of 100% distance learning. The senior and master humanity students have experience of studying both in classrooms and distantly. They could understand the advantages and disadvantages of distance learning. Their new need in distance learning is 25.00% - 46.25%. This means they like distance learning more than the first-year humanity students. Third, it is very interesting to compare our results with the results published in the article (Zhurba et al., 2021). In the article (Zhurba et al., 2021), humanity students were interviewed. They were the senior and master humanity students of university. Their need in distance learning was 54.20% - 68.66% just before the pandemic came (Zhurba et al., 2021).

Now the senior and master humanity students' need in distance learning is 25.00% - 46.25%. This amount is less than it was just before the pandemic came: 54.20% - 68.66% (Zhurba et al., 2021).This fact may mean the rejection of an excessive amount of distance classes by humanity students of senior and master courses. This fact may prove our theoretically justified assumption that students feel uncomfortable when their needs are not realized.

Does the new knowledge gained by the authors have serious practical significance?

The new knowledge gained by the authors has serious practical significance. Now we know the amount of this new needs in distance learning as a percentage of the number of classes. Therefore, universities can meet it after the end of the pandemic. The amount of distance learning should be about 25% for the first-year humanity students. This decision meets their needs in distance learning. The amount of distance learning should

be about 25% - 45% for the senior and master students. This decision meets their new needs in distance learning. So, the results obtained have serious practical significance:

- The authority of Ukraine and, possibly, other countries should abandon the state decisions of 100% distance learning, as the only correct solution. At least, the result obtained concerns humanity students.

- The authority of Ukraine should look for other ways to protect student health during the COVID-19 pandemic in Ukraine.

Does the empirical study have theoretical potential?

The authors call for a theoretical understanding of the results obtained in order to create a mechanism for predicting the changing educational needs of students. It also seems natural that teachers are making increasingly loud statements, such as in Poland, about the need to change curricula at the state level (Bilas, 2021). The basis of the statements is the experience of the last distance year. "Online learning is exactly about new technologies and obtaining knowledge in a new format," the Ministry of Education and Science of Ukraine repeats (Stepko, 2021).

- The didactic theory should be changed in accordance with the humanity student need in distance learning. This measure will reduce the moral discomfort of students both during the pandemic and after its finished. This measure will also improve the quality of education (Maslow, 1954).

- As for student health in Ukraine, it is necessary to create new approaches to protecting the health of students. These approaches should not rely only on 100% distance learning of students in the context of the COVID-19 pandemic or new possible pandemics. At least, these ideas concern humanity students.

Is the number of respondents sufficient to make a decision?

The research methods used allow us to assume that the number of respondents is sufficient for making decisions and recommendations. For example, in paper (Shareefa et al., 2021) it was enough for 52 respondents to make decisions and recommendations. There were only 60 students in the sample in the paper (Hasanuddin et al., 2021). So, in our study, the 77 personal opinions were foundation for gained new scientific knowledge. At the same time, limitation of the study is a small number of specialties of the surveyed students. The number of the respondents allows us to get an overall picture. In the first approximation, statistical methods make it possible to extrapolate the obtained result to all humanity students of Ukraine. The result is highly statistically significant (99.0%). Therefore, we can make decisions with an accurate and predictable probability.

Conclusion

The aim of our empirical study is achieved. The authors have rejected the Null hypothesis. They have accepted the Alternative hypothesis. This means that the humanity student new needs in distance learning do not meet the state decisions of distance learning during COVID-19 Epidemic in Ukraine. The result is highly statistically significant (99.0%). The study has theoretical significance as a basis for understanding of the results obtained in order to create a mechanism for predicting the changing

educational needs of students in distance learning. The experience of the last academic year shows that distance learning is exactly new technologies for obtaining knowledge in a new format. The didactic theory should be changed in accordance with the humanity student need in distance learning.

This study is helpful for other higher education institutions who use distance learning. The results obtained have important practical and social significance. And they allowed to formulate multi-level recommendations of distance learning in Ukraine. These recommendations lead to the student health care and the growth of the quality of higher education. Studying the student new educational needs in distance learning for technical and natural profiles is the aim of the next step of the study.

Recommendations

New knowledge is of practical importance and allows us to formulate multi-level recommendations related to distance learning during the COVID-19 pandemic in Ukraine:

1. Ukrainian universities should face to the new needs of humanity students in distance learning after the end of the pandemic:

- The amount of distance learning should be about 25% for the first-year humanity students. This decision meets their need in distance learning.
- The amount of distance learning should be from 25% to 45% for the senior and master humanity students. This decision meets their new need in distance learning.
- The didactic theory should be changed in accordance with the humanity student new need in distance learning.

2. The authority of Ukraine should look for other ways to protect public health in the student community during the COVID-19 pandemic in Ukraine.

3. The authority of Ukraine should abandon the state decisions of 100% distance learning, as the only correct solution. Ukrainian universities should use hybrid way of learning.

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Perceived Stress and Self Esteem: Mediating Role of Self Efficacy among IELTS Test Takers Abstract

Syeda Zahra, Sumbal Rosheen and Fatima
Lahore Garrison University

The study looked at the impact of self-efficacy (SE) in mediating the link between perceived stress (PS) and self-esteem (SE) among IELTS test takers. A correlational research design was employed to carry out the current research. 280 IELTS test takers were selected who already attempted one or more trials of IELTS, through purposive sampling strategy. The data were collected from 15 different academies for IELTS preparation in Lahore. The main finding of the study was that between perceived stress and self-esteem, there was a partial mediation impact of self efficacy among IELTS test takers. The results also revealed that those test-takers who gave more attempts of IELTS experience higher stress and lower self-esteem and self-efficacy. The findings were presented in terms of the necessity of offering professional support to participants in terms of increasing their self respect, self belief and overcome the stresses .

Keywords, Perceived Stress, Self Esteem, Self-Efficacy, IELTS Test Takers

Language test takers have been the subject of attention for research and practice in recent years. The study looked at how examinees' ambition and opinions of test utilization and composition are related to the examination practices, utilizing the general English component of a prestigious university entry exam as the focal point (Razavipour, Mansoori, and Shooshtari, 2020). In particular, this study found that growing trends in The International English Language Testing System (IELTS) has an impact on test takers' reported stress, self-esteem, and self-efficiency. IELTS is essential for a person who wishes to migrate or needs to achieve their education in English-speaking countries or work in such countries. According to the British Council's IELTS report released in March 2019, globalization and migration for higher education and improved employment possibilities result in roughly 3.5 million people taking the IELTS exam each year (Sujath & Prabhakar, 2021). The researchers investigated stress hormone (cortisol) tendencies by comparing baseline days to high-stakes testing days and concluded that high-stakes testing is associated with stress hormone (cortisol) replies that are proportional to test presentation (Heissel, Adam & Doleac, 2021). The purpose of a recent inquiry for IELTS writing task 2 instructors and learners is to uncover recurring challenges and provide associated solutions (Nguyen & Nguyen, 2022). Seyyedrezaei (2021) investigated the

Correspondence concerning this article should be addressed to Dr. Syeda Mehreen Zahra, Assistant Professor, Department of Psychology, Lahore Garrison University, Email: mehreensyeda@gmail.com

Iranian Non-English Ph.D. Students who prepared for English Proficiency Test (EPT) had a low degree of self-belief in the ability to pass the trial even with inspiration at a high level and further discovered a high rate of stress, test anxiety, hopelessness, anxiousness, family stress or tension, motivation, and a high percentage of university dropouts among participants. Breeze & miller in 2008 found that IELTS is ranging from 1 to 9 band scores assessing four skills i.e. "reading, writing, listening, and speaking", which is applicable for 2 years. 6.0 is interpreted as the red line among most of the institutes all around the world and academic failure is considered among below 6.0 band and which is unacceptable, (Taylor & Weir, 2012). The way of achieving required band people gets tense so the current study found that IELTS test takers given no of attempts to achieve required band would create perceived stress and also affect their self-esteem.

Lazarus and Folkman (1984) stated an event put off or threatens the accomplishment of important goals and objectives and it put at risk the highly valued potential of a person is described as stress. As this language, proficiency tests are goal-oriented tests so failure or success in these tests affects the test taker's stress level, self-esteem, and self-efficacy. Hans Selye (1956) introduced the Response model describe stress as a defense mechanism, followed by three phases "alarm stage, resistance stage, and exhaustion stage". The Model supports the purpose of the current study that IELTS test takers attempted more trials of the test to overcome their stress level and achieved their goals and satisfied their self-esteem and efficacy. Moreover, the current trend investigated that a high level of stress may affect learners' capacity to concentrate on a certain subject (Seyyedrezaei, 2021). The present study found perceived stress and self efficacy may effectively influence self-esteem of test-takers of language proficiency tests.

Albert Bandura (1986) proposed the "self efficacy approach". The theory's originator recognized that "self efficacy" is a type of cognitive evaluation that each individual is developing to the best of his or her ability. For that reason, one's self efficacy is to decide one's own ability to organize and organize one's activities to achieve certain results. Self efficacy theory supports the present research aim that perceived stress, self esteem and self efficacy of test-takers depend on No of attempts in the way of achieving the required band of tests.

Rosenberg (1965) defines that a comparatively secure feeling of overall self-worth is known as self esteem. Higher potential of self efficacy will generally be predicted by people who have come to perceive themselves as highly competent, significant, flourishing, and praiseworthy (Gardner & Pierce, 1998) people who taking IELTS are also competent and had high expectations with tests and outcomes of a test should affect their self-worth (Dev & Qiqieh, 2016).

Literature review

It is important to find how Perceived stress, self esteem, and self efficacy were used in times of yore researches concerning different conditions. The current trends explored by using self-report measures, researchers discovered that mindfulness and self-efficacy had a negative association with anxiety, depression, stress, and shows that among Indian IT workers, self-efficacy acts as a mediator between depression, anxiety,

stress, and mindfulness. (Sharma & Kumra, 2022). Choosing a Career revealed that self-efficacy significantly moderated the role of emotional intelligence and self-esteem on professional flexibility (Hamzah, Kai Le & Musa, 2021).) Higher levels of perceived stress were strongly connected to higher levels of anxiety, which in turn were linked to worse sleep quality and exhaustion. Self-esteem mitigated the indirect effect of perceived stress on sleep quality by reducing the effect of perceived stress on anxiety. This demonstrated that the anxiety had a greater mediation impact in those who had low self-esteem than in people who had high self-esteem (Zhao, Lan, Li, & Yang, 2021). Some qualitative methodologies investigate how candidates' attitudes about self-directed IELTS preparation influenced the aesthetic, behavioural, and cognitive engagement with virtual instructor comments and feedback (Pearson,2022), as well as how professionals saw students' failure to fulfill predictable expert principles in information structure, timeliness, and L2 verbal communication narrative (Dressen-Hammouda, & Wigham, 2022). Vaezi and Fallah (2011) were studied "the relationship between self- efficacy and stress among 108 EFL teachers in Iran". Mahmud (2018) investigated "the washback effects of the Malaysian University English Test (MUET), a high-stakes compulsory university entry test". While the present study seeks to explore IELTS test takers of Pakistan, IELTS is also a high stake test necessary requisite in foreign countries for immigration. The study investigated "the casual interaction between mindful awareness and perceived stress in university students, with the function of self-efficacy, emotional intelligence, and personality factors as moderators" (Heidari & Morovati, 2016). The study found that "Academic achievement among immigrant college freshman is influenced by self-efficacy and perceived stress", While the current study concentrated on English language proficiency test takers' stress, self-efficacy, and self-esteem (Zajacova, lynch, &Espenshade, 2005). Friedlander, Reid, Shupak, Cribbie (2007) studied "the impact of stress, social support, and self-esteem of first-year graduates while adjusting to university". According to Molero, Perez-Fuentes & Gazquez (2018), "positive attitudes about one's efficacy boost one's self worth and make people better able to cope with stressful events such as academic overload, examinations, and so on". The current study reveals a significant positive link between self esteem and self efficacy in English language proficiency test takers unlike earlier studies on nurses' workload.

The rationale of the study

NNES (Non-native English-speaking) individuals must obtain recognized and credible proof of English language proficiency (ELP) following the requirements of gatekeepers (test-users) such as universities, professional, training organizations, self-employed persons, and immigration officials in international cross-border population migrations for career, educational, and family reasons. The requirement to consider a wide range of opinions is essential in this work, particularly Non-English individuals who prepared for the English Proficiency Test (EPT) faced fears, despair, tensions, and stress, which affected their degree of motivation and self efficacy views (Seyyedrezaei, 2021). The literature suggested a wash-back impact on English proficiency tests, and the majority of studies focused on selective proficiency (i.e. writing feedback, speaking, etc) and its effects (Pearson, 2022; Dressen-Hammouda et.al, 2022). Furthermore, Furthermore, the research explores the mediation relationship between self efficacy(mediator), perceived stress, and self esteem in a range of contexts (Hamzah,

et.al, 2021; Heidari, et.al, 2016). It is essential in this quest to assess the influence of IELTS on people who take it frequently to obtain the desired bands. Given the current paucity of knowledge, the current study intends to increase understanding about the perspectives of failing to achieve intended bands, which can affect an individual's self worth, self concept, and stress level.

Aims and Objectives

The suggested study sought to ascertain the role of self-efficacy in mediating the link between self esteem and perceived stress in IELTS test takers. The study's goal was to assist IELTS test takers who were concerned about obtaining trials over and over again in maintaining their self-esteem and efficacy.

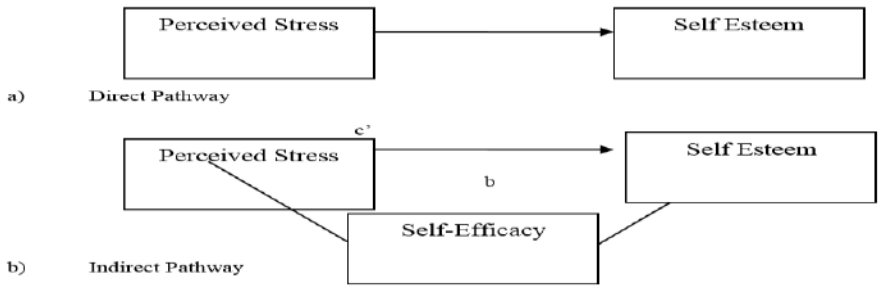
Research hypotheses

H1= Self-Efficacy would most likely mediate the relationship among Perceived Stress and self-esteem of IELTS test takers.

H2= In IELTS test takers, perceived stress would most likely have a negative association with self-efficacy and self-esteem.

H3= There would likely to be a positive relationship between self-efficacy and self-esteem among IELTS test takers.

Figure 1. Theory Through a Set of Path Models



a) Indirect Pathway

Figure 1. Generic mediation model being tested (based on Barron & Kenny, 1986). Proposed mediation model to estimate path towards self- esteem. Adapted from "The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, And Statistical Considerations". *Journal of Personality and Social Psychology, 51*, 1173-1182.

Method

The correlation research design was used to investigate the association among perceived stress and self-esteem, with self efficacy functioning as a mediator. A quantitative research approach was utilized since the study concentrated on deliberate and statistical measurements, mathematical or numerical analysis of data obtained from scales.

Sampling Strategy and sample

Purposive sampling was employed to collect data in this study since the sample was drawn from the population with a specific goal in mind; it is also referred to as judgmental, selective, or subjective sampling. The sample for the study consisted of 280 IELTS test takers who had previously taken one or more IELTS attempts. 75 percent of those who took the first two IELTS trials and 25 percent of people who took three or more trials were included in the research and were currently preparing for subsequent IELTS test attempts at academies. The sample was taken in the Pakistani city of Lahore. 350 questionnaires were issued, 300 of which were returned, and 20 of which were discarded because some were incomplete. A total of 280 questionnaires were completed correctly. As a result, the response rate was 80%.

Assessment Measures

The three evaluation measures used in this study were the Perceived Stress Scale (Cohen, 1994), the General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995) & the Rosenberg Self-Esteem Scale (Rosenberg, 1965).

Perceived Stress Scale

This scale has 10 items, and the phrases on the scale ask about your sentiments and ideas from the preceding month. The responder will be asked to highlight the number of times they felt or thought a specific way in each situation. The responses were graded on a five-point Likert scale, with "0" indicating never, "1" suggesting nearly never, "2" indicating occasionally, "3" indicating rather frequently, and "4" indicating very frequently. PSS scores are computed by inverting the outcomes (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1, and 4 = 0) to the four positively stated items (items 4, 5, 7, and 8) and then averaging over all rating scales. The Perceived Stress Scale has an accuracy of 0.80 (Cohen, 1994).

General Self efficacy scale

The questionnaire was used to examine participants' perceived self-efficacy in related to everyday discomforts and adjusting to stressful experiences. On a four-point Likert scale, the measure had 10 items. Respondents must choose one of four options: "1" means "not at all," "2" means "barely true," "3" means "moderately true," and "4" means "absolutely true." GSES scores are computed by adding every reply to arrive at a total amount grade. The marks range from 10 to 40. The overall dependability of the scale was 0.90. (Schwarzer & Jerusalem, 1995).

Rosenberg Self-Esteem Scale

A ten-item scale evaluates both positive and negative self-perceptions to assess overall self-worth. The scale was considered to be one dimensional. All items are scored on a 4-point Likert scale, with 1 indicating highly agrees, 2 indicating agree, 3 indicating disagree, and 4 indicating strongly disagree. Items 2, 5, 6, 8, and 9 are scored in the opposite order. Give one point for "Strongly Disagree" and two points for "Disagree." "Agree" is worth three points, while "Strongly Agree" is worth four. Add up the points for all ten things. Keep a constant scoring scale. Better scores indicate a higher sense of self-esteem. The reliability of the scale was 0.88. (Rosenberg, 1965).

Procedure

To begin, permission was acquired from the authors of the scales through email for data gathering. After obtaining authorization from the developers of the scales, the researcher began looking for IELTS academies. Data were collected from several IELTS academies in Lahore, Pakistan, where IELTS test takers were practicing for their upcoming trial. The respondents were given some information about the study and how to complete out the scales, as well as assurances that their information would be kept secret and solely used for academic purposes. Then, request that they read the entire questionnaire and answer it.

Statistical Analysis and results

The entire data were recorded into SPSS version 21. The suitable statistical threshold was set at 0.05. Demographic information was evaluated using frequencies, percentages, averages, and standard deviations. Pearson product moment correlation analysis was used to identify the correlations between variables, linear regression analysis was used to determine the first three assumptions of mediation analysis, and hierarchical regression analysis was used to determine the fourth assumption of mediation analysis.

Demographic characteristic

Demographic characteristic describes there were more men than women who participated in the study. Most of the IELTS test takers were bachelor (42%) and master's degree holders (30%) and fewer are intermediate degree level (5%) and specialized in other degrees (13%). Most of the participants of the study were taking an academic module (66%) than a general module (34%) of IELTS. Maximum research participants attempted the first two trials (75%) of IELTS. Most exam takers intended to attain bands in the ranges of 7 to 8.5 (55%) and minimum were indented to gain bands in between 5.5 to 6.5 (45%), as specified by their preferred universities, professionals, and training organizations. In all of their IELTS tries, the majority of test takers received bands in the range of 4 to 6. Table 1 displays the findings of utilizing person product-moment correlation to determine the relationship between variables such as “perceived stress, self-efficacy, and self-esteem”.

Table 1

Intercorrelations among "Perceived Stress, Self-Efficacy, and Self Esteem" among IELTS Test Takers

Variable	1	2	3	4	5	6	7	8
1.Age	-	.42**	.14	-.24**	-.26**	-.07	.13	.09
2.Monthly income		-	-.05	.01	-.22**	-.01	.08	.05
3.Gender			-	-.12	-.10	-05	.03	.01
4.IELTS modules				-	.03	-.08	-.03	.15
5. No of attempts					-	.75***	-.57***	-.61***
6.Perceived stress						-	-.49***	-.70***
7.Self efficacy							-	.34***
8.Self esteem								-

Note. Gender is coded as 0 = men, 1= women; IELTS modules is coded as 0 = general module, 1= academic module.

*df=278. *p <.05, **p < .01, ***p< .001.*

The results showed that age had a positive significant relationship with monthly income ($p < .05$); age had a negative relationship with IELTS module (general module) ($p < .05$). Monthly income was a negative significant relationship with no of attempts at IELTS ($p < .05$). The number of attempts had a strong positive relationship with perceived stress ($p < .001$) while the Number of attempts had a strong negative relationship with self esteem and self efficacy (p< .001) among IELTS test takers. Similarly, perceived stress has negative relationship with self esteem and self efficacy (p< .001). The results also showed that gender and IELTS module has no significant association with perceived stress, self-esteem and self-efficacy.

Mediation analysis

Mediation analysis was carried out using Barron and Kenny (1986) mediation model. Perceived stress was set as predictor (IV or X), self-esteem was the outcome (DV or Y), and self-efficacy was the mediator (M). In order for mediation analysis to be significant, four assumptions must be satisfied. The typical technique of mediation entails three processes of linear regression analysis to show the connection between variables. The first assumption is IV predicts DV step is to find the total effect (c) i.e. (X → Y), second assumption is IV predicts M and the step is to find indirect outcome referred as a (X → M), and the third assumption and step is referred to as b (M → Y) such as M predicts DV. The mediation is significant if direct effect X and Y is significant and indirect effect is zero. The indirect effect is smaller than direct, if the direct effect is still significant, it is called partial mediation.

The first assumption of mediation analysis was identified using linear regression analysis, the results demonstrated that perceived stress highly predicted self-esteem ($p < .01$; β=-.69**), As a result, linear regression analysis revealed that IV predicts DV, validating the first premise of mediation analysis.

The second assumption was identified by linear regression analysis, Perceived stress substantially predicted self efficacy ($p < .05$; β= -.49**), according to the findings. It has fulfilled the condition of the second assumption, thus we can go on to the third

assumption by performing linear regression analysis. The findings revealed that self efficacy significantly impacted self esteem (*p <.05; β=.34***).

The third premise of mediation is also made, which is that the mediator predicts DV. Then, using a hierarchy regression analysis, Table 2 shows the four final assumptions of mediation analysis that we identified.

Table 2

Hierarchal Regression analysis predicting mediating role of self efficacy in perceived stress and self esteem among IELTS Test Takers

	Block 1		Block 2		Block 3	
Predictor	B	S.E	B	S.E	B	S.E
Block 1						
IELTS modules	.13**	.36	.13**	.36	.10*	.32
Number of attempts	-.60**	.14	-.60**	.17	-.24**	.20
Block 2						.
Self efficacy			.14*	.03	.05	.03
Block 3						
Perceived stress					-.52**	.03
R	.62		.62		.71	
R^2	.39		.39		.51	
F	89.42**		59.40**		71.57**	

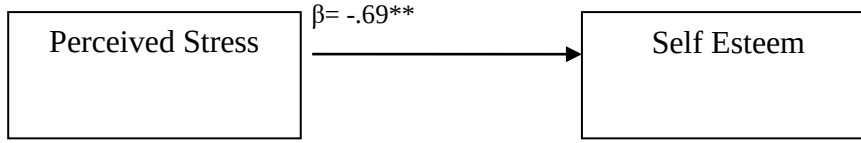
*Note. DF=278 *p <.05, **p < .01, ***p< .001; β= standardized coefficients*

Results showed that self efficacy partially mediated the relationship between perceived stress and self esteem. After introducing confounding factors (IELTS modules

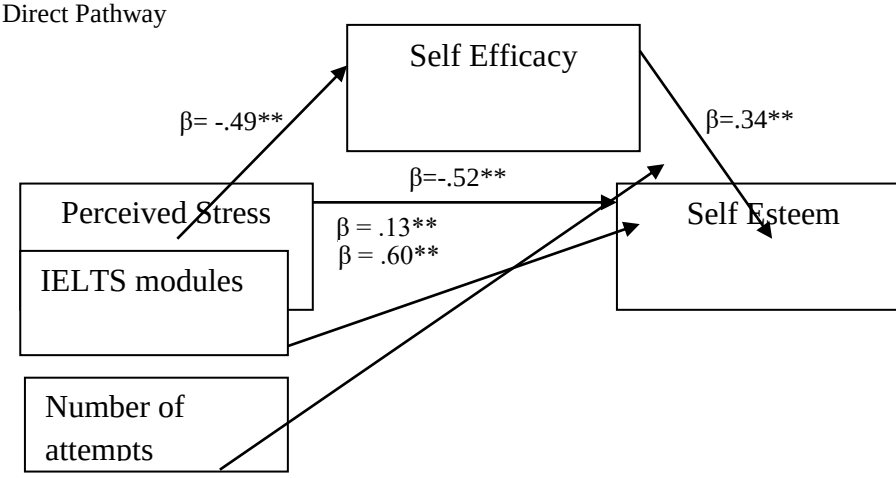
and no of attempts), and self efficacy as a mediator perceived stress significantly predicted self esteem and the value of β is reduced from -.69** to -.52** (p< .05). The value of the Sobel test (sobel= -6.83, *S.E*=0.01 & *p*= .01) It was also discovered that significant mediating effect among perceived stress, self efficacy, and self esteem of IELTS test takers.

Figure 2 depicts a more practical explanation of the mediation analysis using the statistical model for research.

Figure 2 Statistical Model of Mediation



a) Direct Pathway



b) Indirect Pathway

Figure 2 showed that self-efficacy partially mediates the relationship between perceived stress and self-esteem after controlling the effect of confounding variables and mediator

Discussion

The study investigated the association between stress, self esteem, and self efficacy among IELTS test takers. Past research supports the result that there is a negative relationship between self efficacy and perceived stress but self esteem and perceived stress had positive relationships (Reilly, Dhingra & Boduszek, 2014). Present research supported by the previous study that the individual's ability to cope in the threatening situations experience greater self efficacy and less stress as a consequence of their beliefs (Alden, 1986; Bandura, 1997; Chaplain, 1995; Nobile and Mccormick, 2005). The study backs up previous research findings that there is a substantial link between higher education and depression, as well as worse self-esteem with rising perceived stress (Ifantopoulou, Artemiadis, Triantafyllou, Chrousos, Papanastasious and Daryiri, 2015). The study also investigated that self-esteem and self-efficacy had positive relationships among IELTS test takers such as if one increases then the other is also increases. The findings are compatible the current research approach that self-esteem and feeling of self efficacy are positively related (Popa & podea, 2013). The present study also explored that variables of study had no significant influence on the age and gender of IELTS test-takers, and results revealed that there is no specific age limit nor gender

specification in taking the IELTS test so there was no influence on "perceived stress, self-esteem, and self-efficacy".

Perceived stress and self efficacy had no significant influence among types of IELTS while self esteem had a minor influence on types of IELTS. The outcome revealed that Both test types have the same topics and questions so there is no influence on perceived stress and self efficacy among IELTS types because both format and content is almost the same and both versions are purpose full like general is for immigration and implement the purpose and academic is for the medical profession and study purpose while both is used for those who want to work or study for English language countries (Alcisto,2016). Perceive stress had a positive significant relationship with No of attempt while self esteem and self efficacy negative significant relationship among language proficiency test takers. The outcome supports the past research that humanism in psychology shifted to focus on the following effective factors like anxiety, stress, feelings motivation and self esteem bring learning activities among language learners which in turn leads to learner's success (Williams and Burden, 1997). Result also investigated the aim of the study that as no of attempts increased IELTS test takers experienced more stress and lower self esteem and self efficacy because test takers who compelled to try attempts of IELTS again and again but failed to achieve the required bands so IELTS test takers were disappointed and perceived high stress and lower sense of self worth.

The study also emphasizes responsibility of self efficacy as mediator among language proficiency test takers, and the findings show that self efficacy partially mediates the link among "perceived stress and self esteem, and perceived stress" significantly predicts self esteem after controlling for self efficacy. According to Leiter (1991), the conjunction of greater stress and poorer perceived efficacy in dealing with job demands may enhance people's vulnerability to burnout (Sahin & Cetin, 2017). The outcome of the current study supported the mediation model of the current study and there was a partial mediation effect. Results indicated that perceived stress significantly influenced self esteem directly while self efficacy was introduced as a mediator then the degree of significance is reduced, which was consistent with the findings of the research that the degree of relationship between perceived stress and life satisfaction was reduced after self efficacy was introduced as a mediator (Lee, Kim & Wachholtz, 2016).

Conclusion

According to the data, perceived stress was adversely connected to self efficacy and self worth, but favorably related to the number of IELTS test attempts. According to the findings, among IELTS test takers, self efficacy somewhat mediates the link between perceived stress and self efficacy. The study found that test takers who tried more IELTS tries were more stressed, which led in lower "self efficacy and self esteem". The research shared purpose of the "stress, self-efficacy, and self-esteem" concerns that people confront when preparing for the IELTS. The research also advised that a counselling cell be established at IELTS academies to provide stress coping strategies and relaxation techniques to IELTS test takers in order to minimize stress and preserve efficacy and self-esteem.

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Politics of Religion in the Sovereign City Delhi Under the Khaljīs (690-720/1290-1320)

Fouzia Farooq Ahmed
Quaid-i-Azam University, Islamabad

In the fourteenth century, the political relations in the sovereign city of Delhi were patrimonial and were governed through the patron client matrix. The sultan was a patron for the social and political base of the Delhi Sultanate that he actively created and modified in order to win greater political support. The Khaljī sultans were not as religious as their predecessor slave dynasty or successor Tughluq dynasty. The religious groups under Sufis and ʿulamāʾ became more powerful in Delhi and the popular politics they initiated was unprecedented. Present article delves into the politics of religion and explains how the religious elite was able to gather as much support on the streets during the Khaljī era .

***Keywords*:** Delhi, Delhi Sultanate, *ʿulamāʾ*, Sufis, Sultans

Delhi was developed as a patrimonial town (Weber, 1978) by the Delhi Sultans (605-801/1206-1399). The sultans actively constructed the social base and political base of the sovereign city (Ahmed, 2016) by patronizing émigrés, slaves, religious groups including *ʿulamāʾ* and Sufis. (Chughtaī, 1952; Habib, 1992) The sultans developed patrimonial relations with their subjects living in the capital city of Delhi and personalized rewards and punishments. These patrimonial relations facilitated centralization of authority for the sultan who became more powerful as a consequence (Ahmed, 2019). Present article takes into account the data from primary sources and postulates that Sufis and *ʿulamāʾ* were important stakeholders in the politics of Delhi city under the Khaljī dynasty who brought politics on the streets. Nonetheless, the popularity among the masses could never make the religious groups powerful enough to topple the militarily strong Khaljī sultans.

The Delhi Sultanate religious elite hailed from a confraternity that was visibly diverse and connected across the ever fluctuating medieval political borders. However, this fraternity was peripatetic, interconnected and was religious and intellectual in character (Raḥmān, 1970; Kumar, 2007). The thirteenth century was an epoch of ordeals and upheavals for many Muslim polities in Persia, Central Asia, and Arabia owing to the Mongol invasions. Yet these political cataclysms provided social and political bases to the Delhi Sultanate in the form of refugees and émigrés that considered Delhi Sultanate a safe haven. The Sultanate of Delhi historian Minhajus Siraj Juzjani in his seminal work

Correspondence concerning this article should be addressed to Dr. Fouzia Farooq Ahmed, Assistant Professor, Department of History, Quaid-i-Azam University Islamabad, Email: fouzia.farooq@gmail.com

called this nascent polity "the asylum of the universe" for Muslim administrative and intellectual elite fleeing from the Mongol onslaught (Chughtaī,1952).

This newly arriving religious elite was the backbone of state administration in the Delhi Sultanate and was responsible for legal and educational issues in addition to religious matters. They were also consultants of the Sultan since they guided the sultan about legal, religious and political matters and explained to the sultan how to deal with the non-Muslim subjects and make their rule appear legitimate in the eyes of the social and political base (ʿAfif, 1938) . The *ulamāʾ*, with their religious acumen, helped define social rules for the Muslim social and political base as their aim was to give people awareness about how to formulate their lives according to the principles of Islamic law.

In addition to their services in the administration, the Sultans needed the *ʿulamāʾ* to solve theoretical issues central to their legitimacy and offer guidance in how to deal with their non-Muslim subjects. The religious knowledge of the *ʿulamāʾ* also provided guidelines to the Muslim populace to formulate their lives according to the *sharīʿa*. The *ʿulamāʾ* were employed in almost all departments of the Sultanate's administration: In the departments of justice *(dīwān-i-qaḍāʾ)* as the chief judge *(qāḍī al-qaḍāʾ)*. These intellectuals also served as diplomats and emissaries due to their respect given to them in the royal courts. They were incharge of policing and served as *shahna/kotwal* (police). They served as market inspectors (*muḥtasib*) and were responsible of fair dealings between consumers and traders. They were incharge of public morals through the office of accountability and public morals (*ḥisba*).They managed the education (*tadrīs*) of Muslims and oversaw vast networks of *madrassahs*. They were also trustees of charitable endowments and public works (*awqāf*) (Ahmad, 1941; Day, 1934; Qureshi, 1942). They were intellectuals who wrote histories of the Delhi Sultanate, it was rare but there were examples that they headed armies.They were consulted in the larger architectural projects as they were consulted while deciding the calligraphic scheme of Qur'anic *āyats* (verses) that were to be inscribed in the monuments. The content of these Qur'anic *āyats* reflected the sultan's political opinions (Welch et al., 2002).

In the Delhi Sultanate, educational and religious institutions replicated the semi-bureaucratic structure of other medieval Muslim polities. The *ulamā* of the Delhi Sultanate regulated the *madrassah* education. In the *madrassahs* the *ijazah* served as authorization, and concluded with *dastar* (turban) and *sanad* (certificate). The *madrassahs* were responsible for a process of socialization and communication that connected the students and developed in the form of a community. Personal piety was considered an important source of an '*alim'*s credibility; in theory, the residents of the Delhi Sultanate recognized two categories: *ulamā, ulamāʾi haqq* (truth scholar) and *ulamāʾi sū* (scholar seeking vested interests) (Nizami, 2002). In practice, these categories were not definitive. Many *ulamā*, sought government positions and earned the reputation as *ʿulamāʾi sū*. The ruler befriended the *ulamāʾi haqq*, and tried to make matrimonial alliances with them. Hardly ever did the sultan persecuted the *ʿulamāʾ* but public punishment or execution of some '*alims* and Sufis was also recorded.

POLITICS OF RELIGION

The role of the *ʿulamāʾ* under the Khaljī dynasty became more complex as rifts within their ranks, as well as tensions between the *ʿulamāʾ* and Sufis, became more pronounced. The Khaljī Sultans were not as religious as their predecessors or successors. The Khaljī dynasty was founded on controversy, after Khaljī Afghans murdered the reigning sultan, Balaban's grandson Muʿizz al-Dīn Kayqubād, and seized the throne. Many of Delhi's residents sided with the Turkish *umarāʾ* of the Balaban era; indeed, their opposition was so strong that the newly enthroned Sultan Jalāl al-Dīn Khaljī could not enter Delhi for a year.

The trial of Sīdī Muwallih in the era of Jalāl al-Dīn Khaljī is a case that helps to explain the colliding networks of *ʿulamāʾ*, as well as how in this era, Sufis, *ʿālim*s, and administrators formed powerful factions. Sīdī Muwallih hailed from Central Asia and was the leader of a heterodox denomination of Muslim wandering dervishes (Muwallih) (Ḥaq, n.d). He settled in Delhi in the reign of Sultan Muʿizz al-Dīn Kayqubād, where he built a large *khānqāh* (hospice). Sultan Kayqubād's murder was resented by the population of Delhi, and the new ruler, Jalāl al-Dīn Khaljī, begrudged the fact that Sīdī Muwallih's *khānqāh* was visited by many deposed administrators and officers of the Balaban era. The affluence, charity and lavishness of the *langar* (public kitchen) came from unknown sources that raised many eyebrows. Moreover, Sīdī Muwallih had won the hearts of both the masses and many of the notables of Delhi through his performance of miracles. Nonetheless, he was seen with suspicion by many orthodox *ʿulamāʾ* and by members of a rival sect (Haydarī *qalandar*s), who accused him of hatching a conspiracy for regicide in order to enthrone himself as *khalīfa* (Ḥaq, n.d; Bhatti, 1974; Baranī, 2004). In addition to the Crown Prince *Khān-i Khānān* and *qāḍī* of Delhi Jalāl al-Dīn Kashānī, Balaban's Hindu officers (*pahilwāns*) Hathya *payak* and Niranjan *kotwāl* sided with him (Bhatti, 1974; Baranī, 2004). The *qāḍī* of Delhi, Jalāl al-Dīn Kashānī, had been serving in the role since the previous regime and was son of an *ʿālim* named Quṭb al-Dīn Kashānī (Ḥaq, 2004; Bhatti, 1974; Baranī, 2004). The historian Ḍiya al-Dīn Baranī mentions him as a '*fitnaparwar*' or a strife-monger who was transferred to Badaun as *qāḍī* after the incident (Ḥaq, 2004; Bhatti, 1974; Baranī, 2005). A Mongol commander named Malik Ulghu reported the conspiracy to the sultan's younger son Arkalī Khān. Though the allegations were never proven, the sultan demanded that Sīdī Muwallih walk on fire in order to prove his innocence. However, the *ʿulamāʾ*, especially officers of the justice department, dissuaded the sultan by arguing that fire does not distinguish between the innocent and the guilty. Jalāl al-Dīn ordered Sīdī Muwallih's rivals, the Haydarī *qalandar*s, to stab him with a knife, and later Prince Arkalī Khān had the wounded Sufi trampled under an elephant's foot. Orthodox *ʿulamāʾ* like Ḍiya al-Dīn Baranī attributed the later misfortunes of Jalāl al-Dīn Khaljī's reign including drought and famine to Sīdī Muwallih's unjust murder (Habibullah., 1970; Isami, 1348; Ḥusayn, 1938; Chishti, 1982,; Riazul, 2002).

The next ruler, ʿAlāʾ al-Dīn Khaljī (695-715/1296-1316), faced rebellions and dissent immediately after his ascension to the throne. In 1299, the generals of Aladdin, Nusrat Khan and Ulug Khan also rebelled near Jalor. In 1301, ʿAlāʾ al-Dīn Khaljī, the new reigning monarch, encountered three popular uprisings. The first uprising was led by his nephew Akat Khan, who attempted to murder the Sultan during a hunting expedition

in Tilpat Haryana. (Saksena 1992) Akat Khan was given capital punishment as a consequence of his conspiracy. (Lal, 1950)

The second conspiracy was led by his sister's sons Malik Umar and Mangu Khan. The rebellion happened in the region of Awadh in the provincial army as the nephews tried to recruit a rebel army by recruiting soldiers. The aim of this rebellion was to oust ʿAlāʾ al-Dīn Khaljī's government in Awadh (Lal, 1950). This rebellion if successful would have financially impacted the Delhi government. However, the uprising was suppressed by ʿAlāʾ al-Dīn Khaljī 's loyal officers, and the rebels were executed. (Saksena 1992)

The third uprising was organized by a slave official from Delhi named Haji Maula. The Sultan was not in the capital and a vast majority of people relied around Haji Maula (Lal, 1950). This street power of Haji Maula and unpopularity of ʿAlāʾ al-Dīn Khaljī's officers seemed like a severe threat for the Khaljī dynasty. Nonetheless, Haji Maula was suppressed by the confidant of ʿAlāʾ al-Dīn Khaljī Malik Hamiduddin. The rebels were taken to task and harsh punishments were given to them (Saksena 1992).

In order to counter the reoccurrence of rebellions Sultan ʿAlāʾ al-Dīn Khaljī consulted his confidants and ministers in order to devise strategies to curb resistance. The sultan after consultation took the following measures to prevent further uprisings (Saksena 1992).

First, he established a secret service and surveillance network to preempt any occurrence. Second, he controlled all the socialization of his nobility so that they could not join hands and make common causes against the Sultan. Third, he made the financial conditions of the nobility of Delhi weak by confiscating most of their properties. Thus, the sultan deprived the nobility the leisure for interest aggregation and interest articulation and thus controlled them with iron hands. After taking these measures, there was no major uprising during ʿAlāʾ al-Dīn Khaljī 's reign (Lal, 1950).

Sultan ʿAlāʾ al-Dīn Khaljī was not as religious as many of his predecessors. However, three *ʿulamāʾ* were very close to the sultan, namely, *qāḍī* Mughīth al-Dīn Bayanwī, Mawlana Zahīr Lang, and Mawlana Mashīd Kuhrāmī, who accompanied the sultan at his food table and on sojourns (Bhatti, 1974). Despite their intimacy with him, these *ʿulamāʾ* nonetheless feared the sultan for their lives. The sultan debated with *qāḍī* Mughīth al-Dīn about issues like treatment of Hindus by Muslim rulers, the question of jizya, and who, according to Islam, is a just ruler. The *qāḍī* remained invariably reluctant to reply, since he feared the wrath of the sultan in case his opinion offended him. The argument concluded with the sultan saying that the *ʿālim*'s views were unrealistic as his knowledge lacked practical wisdom (Bhatti, 1974; Barani, 2005; Ḥasanī, n.d).

Despite the fact that ʿAlā al-Dīn Khaljī did not promote religious groups in the manner of his predecessors, there remained a visible presence of multiple networks of *ʿulamāʾ* in Delhi, including teachers like Mawlānā Iftakhār al-Dīn Rāzī, Mawlānā Iftakhār al-Dīn Baranī, Mawlānā Tāj al-Dīn Kalāhī and Tāj al-Dīn Muqaddam Dihlawī

(Bhatti, 1974; Barani, 2005; Ḥasanī , n.d). Mawlānā Badr al-Dīn Awadhī and Mawlānā Burhān al-Dīn Bhakarī were also important teachers of this era (Bhatti, 1974).

ʿAlāʾ al-Dīn Khaljī transferred a significant number of *ʿulamāʾ* from their positions. For example, *Shaykh al-Islām* Quṭb al-Dīn Muḥammad b. Aḥmad Ḥasanī's son Tāj al-Dīn was the *qāḍī* of Karh and belonged to a renowned family of *qāḍīs.* However, he was transferred from Karh to Badaun by ʿAlāʾ al-Dīn Khaljī, where he spent rest of his life. His nephew Rukh al-Dīn was made *qāḍī* of Karh on place (Bhatti, 1974; Baranī, 2005).

In this era, the Chishti Sufi Shaykh Niẓām al-Dīn Awliyāʾ(635-725/1238-1325) had devotees among the *ʿulamāʾ*, members of the royal family, other segments of *umarāʾ*, and the popular classes and was known with the titles *maḥbūb-i Ilāhī* (beloved of God) and *sultan-al mashāyiʾkh* (Gaborieau, 2000). The sultan at one point became apprehensive that Niẓām al-Dīn Awliyāʾ had political ambitions, however perhaps recognizing the risk he never challenged the Sufi (Khurd, Saiyyid Muhammad ibn Mubarak. 'Alawi Kirmānī, *Siyar al-Awliyāʾ*, ed. Chiranji Lal, Originally composed 1351-82 A.D., (Khurd, 1885; Anjum, 2014). Nīẓām al-Dīn Awliyā influenced his disciples' decisions to accept or reject government positions. For instance, a *khalīfa* (successor) of Niẓām al-Dīn Awliyāʾ, Muḥyi al-Dīn Kāshānī, who came from a family of *qāḍīs* in Awadh, was appointed *qāḍī* of Awadh by Sultan ʿAlā al-Dīn. This appointment severed the *qāḍī*'s relation with his mentor, who withdrew the *khilāfat* from him. Later the *qāḍī* resigned from his official post to restore his relationship with the Sufi (Bhatti, 1974; Baranī, 2005; Ḥaq, n.d; Ḥasanī, n.d).

Religious groups in Delhi Sultanate were divided between the Sufis and the *ʿulamāʾ*, however these categories often overlapped. Sufi-*ʿulamāʾ tensions* in the Delhi Sultanate were made manifest in the debate on the legality of *samāʿ* (devotional music) (During, 2005). The Chishti Sufis, headed by Shaykh Niẓām al-Dīn Awliyāʾ , believed that it was *ḥalāl* to use music and dance in Sufi *maḥfil*s. However *ʿulamāʾ* like Shaykh ʿUmar Sunāmī, a Ḥanafī preacher, and jurist *qāḍī* Jalāl al-Dīn Walwājī, considered it *ḥarām* (Bhatti, 1974; Baranī, 2004; Ḥaq, n.d; Ḥasanī, n.d). There were some Balaban era *ʿulamāʾ* like Shaykh Burhān al-Dīn Balakhī who considered *samāʿ* as a great sin, however they could not resist it (Bhatti, 1974). Instances abound of disagreement between Sufi and *ʿālim* converting to a Sufi worldview. Shaykh Dāwud b. Ḥusayn b. Maḥmūd of Shiraz (also known as Zayn al-Dīn) had traveled to Ḥijāz (*c.* 701/1301) before settling in Daulatābād. He was initially against *samāʿ*, however later he reversed his attitude and became a disciple of Burhān al-Dīn Hanswī (Bhatti, 1974). Mawlānā Fakhr al-Dīn Zarādī was also against *samāʿ* but later changed his views (Bhatti, 1974; Kirmānī, 1885).

Sultan ʿAlāʾ al-Dīn patronized some *ʿulamāʾ* and bestowed upon them largess and privileges in exchange of their support. While generosity towards religious groups was seen as an important duty of a sultan, many refused to receive such help. Niẓām al-Dīn Awliyāʾ was offered villages by ʿAlāʾ al-Dīn Khaljī multiple times, but he refused (Bhatti, 1974). The sultan admired Shaykh abu ʿAlī Qalandar (605-724/1209-1324), a

veteran Sufi-ʿ*ālim* who had brought a large number of locals into the fold of Islam, but who would not accept his grant (Bhatti, 1974). Therefore, the sultan took help from Niẓām al-Dīn Awliyāʾ and Amīr Khusraw as mediators, and the grant was eventually accepted. Likewise, Shaykh Ṣadr al-Dīn Kuhramī of Delhi not only avoided the sultan and his officials but also refused the sultan's offer for a grant of 10,000 dinars and villages (Bhatti, 1974; Ibn Baṭṭūṭa, 1986).

An incident relating to Khwāja Shams al-Dīn Turk reflects two themes; how territories were assigned to ʿ*ulamāʾ* and Sufis assigned by their mentors missions to reach out to masses and conflict resolution between different ʿ*ulamāʾ*. Khwaja Shams al-Dīn Turk came and settled in Panipat where Shaykh AbuʿAlī Qalandar had already established himself. Shams al-Dīn sent a glass full of milk, a symbolic gesture carrying an implied meaning: I have been allotted this territory by my Shaykh and there is no space left here for another religious figure. Shaykh Abu ʿAlī Qalandar returned the cup of milk with rose petals floating on top, indicating that he would live in the area without interfering in Shaykh Shams al-Dīn Turk's activities. Because of this both the intellectuals maintained cordial relations with each other (Bhatti, 1974).

The case of a famous Egyptian ʿ*ālim* (*muḥadith*- expert of *ḥadīth*), Mawlānā Shams al-Dīn Turk who come to India along with his collection of four hundred books in ʿAlāʾ al-Dīn Khaljī 's era shows how an ʿ*ālim* could gain the attention of the sultan, as well as how existing members of the bureaucracy sought to guard against such approaches (Bhatti, 1974). Shams al-Dīn Turk stayed in Multan with Faḍal ullah b. Shaykh al-Islam Ṣadr al-Dīn. During his stay, he wrote two books: the *Sharaḥ-i Ḥadīth* (exegeses), and a journal in Persian. The journal was an assessment of ʿAlāʾ al-Din's governance. While the ʿ*ālim* appreciated the sultan's policies towards Hindus, he criticized the sultan's appointments in religious positions, especially the post of *qāḍī*. He observed that *mufti*s issued *fatāwa (*plural of *fatwā)* after taking bribes. He was of the view that the sultan should not give preference to *fiqh* as *ḥadīth* should be the prime source of Islamic jurisprudence (Islam, 2005). Although Turk's *Sharaḥ-i Ḥadīth* reached the sultan, the journal was deliberately not conveyed by the sultan's secretary. Later, the sultan learned of the journal, but to his dismay Shams al-Dīn Turk had already left India (Baranī, 2004; Bhatti, 1974). From statements in his journal it seems that Shams al-Dīn Turk was making a case for his own appointment in the government administration as *muḥadith*, but his efforts were blocked by existing officers (particularly the secretary Bahāʾ al-Dīn Dabīr).

The life of Abu al-Ḥasan Yamīn al-Dīn (Amīr) Khusraw (652-725/1253-1325) offers a vivid illustration of the fact that there were many ʿ*ulamāʾ* who not only survived periods of political transition but also saw an increase in their position and influence with each passing year. Amīr Khusraw was a Sufi-ʿ*ālim* and a disciple of Niẓām al-Dīn Awliyāʾ who had connections with Sufis, ʿ*ulamāʾ* and rulers. In his long career as a poet, author, musician, historian, royal counsel, administrator, and military commander he survived more than eight transfers of power. Amīr Khusraw's career saw an unremitting rise because of his extraordinary talents (Sharma, 2005).

The case of Niẓām al-Dīn Awliyāʾ best explains how the personal grudges of a sultan could pose a serious threat even to a well networked sufi-ʿ*ālim* . The nominated heir of ʿAlāʾ al-Dīn Khaljī, Prince Khiḍr Khān a disciple of Niẓām-al Dīn, was deposed by 'Alā' al-Dīn Khaljī's *nāʾib* (deputy) Malik Kāfūr in the last days of the sultan's reign. Malik Kāfūr (who had attained great power at the court) enthroned a minor son of the deceased sultan while having Khiḍr Khān blinded and another prince, Quṭb al-Dīn Mubārak Shāh (r. 716-720/ 1316-1320), imprisoned. Mubārak Shāh, who had a rivalry with Prince Khiḍr Khān, nonetheless survived. He had Malik Kāfūr (r. 720/1320) killed and ascended the throne. The new sultan, who was the last ruler of the Khaljī dynasty, not only had Khiḍr Khān and his other brothers executed but also persecuted all of Prince Khiḍr Khān's supporters, including Niẓām al-Dīn Awliyāʾ . The sultan had gathered support from some ʿ*ulamāʾ* that he awarded offices and largess. Shaykh Faḍl. b. Muḥammad Multānī was appointed as *nāʾib wazīr* and Mawlānā Ḍiya al-Dīn b. Mawlānā Bahāʾ al-Dīn who was the son of sultan's teacher, was appointed as *Ṣadr-i jāhān* with a title of Qādi Khān. As a token of acknowledgment, he was given a gold dagger that was studded with jewels (Bhatti, 1974; Kishori, 1950; Saksena, Habib; Nizami). The sultan tried to publicly isolate Niẓām al-Dīn by prohibiting his *umarāʾ* from visiting Niẓām al-Dīn's *khānqāh* in Ghiyathpūr. In the same period, a new mosque, the *Masjid-i Mīrī*, was constructed. It was made mandatory for all the Sufis and ʿ*ulamāʾ* to perform their prayers there. Niẓām al-Dīn did not comply with these orders. It was customary for the ʿ*ulamāʾ* and Sufis of Delhi to assemble at the royal palace and offer prayer with the sultan on the first of each month. Niẓām al-Dīn instead of attending this ceremony sent his servant as a delegate. This angered the sultan who asked Niẓām to either pay homage or be ready to bear serious consequences. Nonetheless, Niẓām refused to heed the orders (Khusraw, 1933; Rizvi, 2012). A few days later Mubārak Shāh was callously murdered by his Guajarati slave-general and protégé Khusraw Khān (r. 720/-1320), who proclaimed himself the sultan. In order to neutralize his image as a usurper and win the support of the people and notables of Delhi, Khusraw Khān distributed money from the royal treasury generously (Saksena, n.d). Niẓām al-Dīn Awliyāʾ accepted the donations made by this new sultan who lasted only two months on the throne. Later, this acceptance of Khusraw Khān's grant damaged relations between Niẓām al-Dīn and the next ruler of Delhi, Ghiyāth al-Dīn Tughluq (r. 721-725/1321-1325). The sultan demanded that Niẓām al-Dīn Awliyāʾ return the donation, however the money had already been spent. The passive hostility of Ghiyāth al-Dīn Tughluq against Niẓām al-Dīn Awliyāʾ is an important chapter in the history of the Delhi Sultanate.

Conclusion

In the Khaljī era the politics came to the streets of Delhi and the social base of the Delhi considered Sufis and '*alims* important role models that were followed. The famous Chishti saint Niẓām al-Dīn Awaliyah was known as the sultan of hearts while 'Ala al-Dīn Khaljī was known as the sultan of army. There were popular rebellions and intrigues in this era where common people rallied around the rebel leaders however, despite all the popular support these rebellions ended in failure because of 'Ala al-Dīn Khaljī's military prowess.

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Gender Differences in the Use of Stimulated Chemistry Practicals at Secondary Level

Farkhanda Jabeen
Fatima Jinnah Women University, Rawalpindi.

Muhammad Tanveer Afzal
AIOU, Islamabad

Waqar Un Nisa Faizi,
Islamia College Peshawar

The focus of this investigation was to see how simulated chemistry practicals affected the performance of male and female students at secondary level. The simulations of ten (10) chemistry practicals were developed. The researcher gave an orientation of three (03) days to the students and teachers about the use of simulation to conduct the chemistry practicals. After orientation, students performed chemistry practicals in the laboratory supplemented with simulations according to the time table in ten (10) weeks. The nature of the research was experimental. The quantitative data was collected and examined. Fifty eight (28 males and 30 female) students were selected as a sample. One(1) male and one female(1) secondary school was chosen to observe the effect of simulation on the performance of male and female students in three aspects i.e. written paper, oral viva and practical manual related to chemistry practicals. At the end practical examination i.e. post-test was taken on the pattern of Peshawar Board of Intermediate and Secondary Education (PBISE). An Independent sample t- test was applied for the comparison of two groups. From the result of an independent t-test it was found that simulations and gender have no relationship. Therefore, null hypothesis was accepted on the basis of the result of an independent sample t- test. It is concluded that both male and female are equally benefited from simulated software.

***Keywords*:** gender, performance, comparison, simulation, written paper, oral viva, practical manual.

Simulations are artificial settings that have been precisely and skillfully designed to govern learner's perceptions of reality. A simulation as an activity that involves the imitation of reality in a simulated world (Jones, 1998). Virtual learning environments and simulations are considered effective if they have the characteristic of

Correspondence concerning this article should be addressed to Dr. Farkhanda Jabeen, Assistant Professor, Department of Education, Fatima Jinnah Women University,

expanding, enhancing, providing and reproducing the content and experiences of the learner in an artificial environment (Cannon-Bowers & Bowers, 2009).

Simulation is a virtual representation of reality. An interactive mode of simulations provides an experiential learning medium to the learner results in an effective learning. Simulators would be effective for learning about difficult situations where an individual is unable to find adequate and reliable data. Simulation provides guidance to the learner by providing hints and clues. Simulation is the solution of many problems related to unique challenges and when the cost of making a mistake while selecting alternatives is very high. .They speed up and slow down time to provide a glimpse into the future. They are rigorous, exploratory, and immersive. They encourage participants to be creative and innovative by interacting with the simulations. Above all, there are no risk factors associated with making decisions in an artificial environment (Dumblekar, 2004).

A particular type of computer modeling instrument that aids inquiry learning by providing visualization chances not available in real-world situations is called simulation (Van Joolingen, De Jong, & Dimitrakopoulout, 2007).In general, at present computers and other instructional technologies are being used in schools at a higher rate. In the past, such tools were underutilized for the development of conceptual understanding in science classrooms (Mistler-Jackson & Songer, 2000).

The researchers have suggested that the teachers mostly used technology for administrative purposes (Doherty & Orlofsky, 2001; Pflaum, 2004; Waight & Abd-el-Khalick, 2007).

Some researchers consider that simulations are similar to the static visualization but others consider them as two separate and different concepts. Simulations are dynamic, interactive whereas static visualization lacks interactivity. An animation shares the chrematistics active user interaction with the simulation (Plass, Homer, & Hayward, 2009). The computer based interactive animations of a phenomena are called visualizations (Linn, Bell, & Davis, 2004).

In order to create the replica of a real laboratory the simulator combines the various effects of voice, movement, smell and vision. The racing car games are examples of low-end simulators. For The training of individuals for any field can be made effective by the use of simulation. Simulations are complex computer based recreations of the real things. Simulated science laboratories are the replications of actual practicals. The simulated software replicates the laboratory environment, therefore, there is no need for infrastructure. Simulated laboratories are economical and cost effective as compared to actual chemistry laboratories. Moreover, these simulated computer based laboratories are perceived as being at least as effective as wet laboratories (Shin, Park, & Kim, 2015). Simulated laboratories demand active participation from the learner and hence improves their practical skills (Faria & Whiteley, 1990; Smith & Pollard, 1986).

STIMULATED CHEMISTRY PRACTICALS

Number of researchers mentioned that mingling simulations, digital media, modeling tools, and virtual collaboration situations can increase knowledge, conceptual understanding and skills of science student (Mistler-Jackson & Songer, 2000; Varma, Husic, & Linn, 2008). Students' capacity to investigate, comprehend problems, drawing inferences, collaboration, coordination, group working is enhanced when information technology is included into science classrooms (Dani & Koenig, 2008; Dickerson & Kubasko, 2007; Linn, Bell, & Davis, 2004). Simulations used in teaching of science are classified into four different fundamental dimensions:

1. level of user control,
2. the guiding framework in which the simulations are integrated,
3. data representation, and
4. the nature of the events to be mimicked

In simulations, a situation based atmosphere is provided to the learner. The learner on the basis of previously acquired knowledge and skills actively involved to solve the given scenario based problem. An important advantage associated with simulation is that it is hazard free and provides safe environment for the development of necessary skills of the learner like identification of problems, leadership, social interaction, communication, collaboration, selecting alternatives, decision making, and prioritizing task prioritization (Flanagan, 2004). The learner can performed simulation based chemistry practicals in groups, in pairs or alone as well depending upon his level of expertise. The simulations perform in groups enhance the spirit of team work and information sharing whereas simulation performed alone results in the development of independent learning and confidence building in the learner (Robertson, 2013). Increased options for collaborative and participatory engagement with technical applications have emerged as a result of the explosion of Web 2.0 technologies. These technologies change the mode of learning by providing quick access to the information, sharing of ideas and concepts, exchange of knowledge and development of content (McLoughlin & Lee, 2008).

The orderly review of 64 articles all together reject the negative relationships of application of simulation and performance of the learners. He concluded that either direct or neutral relationship exist between the two (Smale et al., 2015). The methodological study by different researchers have come up with three important periodic settings for the effective application of simulations i.e. uniqueness, linkage with content and instructor guiding position, all of which are showings similarity with the conclusion and findings of many studies (Bellotti et al., 2013).

Computer simulations to see if they can help with learning of science (Smetana & Bell, 2012). By comparing computer games with conventional games, they discovered that computer games can be just as effective as, if not more effective than, traditional games in creating concepts, enhancing comprehension, strengthening practical skills, and fostering conceptual transformation. Simulations have achieved a significant position in learning practical skills by expanding the teacher's performance, either by supplementing the conventional methods of teaching or as a substitute of teacher-centered instructions and curriculum (Rutten, Van Joolingen, & Van Der Veen, 2012).

The simulation is an artificial environment therefore it is not recommended to depend entirely on simulation for the development of laboratory skills of the learners. Before going to the wet laboratory, simulations equipped the students with necessary skills to be implemented results in an effective laboratory performance. Games, simulations, and virtual environments might help students build concepts in science (Merchant, Goetz, Cifuentes, Keeney-Kennicutt, & Davis, 2014).

Simulation also plays significant role in nursing education and training (Chung et al., 2015). On the basis of comparison after intervention he quoted that trainees exposed to simulation sessions performed well as compared to control group, resulting in the conclusion that simulations are more beneficial than traditional laboratory work in terms of improving the learner's skills, beliefs, and scholarly abilities. Simulations, he claims, give students with clear and real clinical circumstances, allowing them to practice and gain understanding in a safe and risk-free environment.

Literature Review

Boys have a more optimistic response toward information and communication technology, according to the majority of researchers that evaluated students' attitudes toward their use. Boys also utilize ICTs more frequently than girls. In comparison to males, females perceive technology to be more challenging and less stimulating, according to another study (Boser, Palmer, & Daugherty, 1998). At workplace males frequently use technology based instruments in the male dominating society resulting in gender based performance differences (Hill, Loch, Straub, & Elsheshai, 1998).

Gender variations in performance/achievement for males and females have yielded mixed results in study. The influence of gender on computer-based chemical problem solving was explored by many researchers. Many discovered no significant performance variances in male and female students of high school who used a computer to solve stoichiometric chemistry questions. They added that pupils significantly improved in problem solving skills when using a computer because it provided immediate response regardless of the gender of the students. They quoted that the immediate feedback boost the self-confidence of the learner particularly in females and also enhance scientific learning (Helgeson & Kumar, 2000).

Innovative technologies have motivational values and enhance students' academic performance (Fraser & Walberg, 2005). Virtual and computer-based laboratories play an important role in the development of skills and conceptual understanding in science education, particularly simulations. There is no significant difference between the performance of male and female students exposed to computer based simulation teaching approaches (Mihindo, Wachanga, & Anditi, 2017). They further reported that this could be due to the unrestricted interaction and collaboration between boys and girls in district co-educational schools. Students benefit from interaction with brighter students (Wachanga, 2002). On the other hand bright students prepare the content thoroughly in detail before explaining it to others. In general teaching methodologies and strategies that put emphasis on computer based simulations are considered gender friendly. The chemistry computer based simulations are an effective approach that narrow the gender gap in chemistry achievement. When the achievement of

female students in Chemistry at the secondary school level is equally good as that of the males then that good achievement will act as a predictor of choice of science related courses at the university level which have been mainly male domain (Abungu, Okere, & Wachanga, 2014). The research study conducted on 429 South African students concluded that technology is not gender biased (Myburgh, Ankiewicz, & Van Rensburg, 2001).

In the science laboratory gender biases can be reduced by the application of online. The simulations may attract the female student results in more inclination of girls towards the science related courses. Simulation and information and communication technologies actually bridge the gap between theory and practical by providing interactive and experiential learning mode. These tools play important role by creating suspense and interest in all students (Lamb & Annetta, 2012).

The performance of girls were better as compared to boys while using simulations (Vermeer, Boekarts, & Seegers, 2000). In Chemistry and Biology, boys outperformed girls (Opara, 2011). According to the findings of a research conducted in the discipline of Physics there was a considerable disparity in performance between boys and girls (Nyakan, 2008).

Objectives

The objective of the research study was:

i. To investigate the effect of simulated Chemistry practical on the performance of male and female students at secondary level.

Hypotheses

Following null hypothesis were tested to achieve the objectives

H_{01} There is no statistically significant difference in the result of written papers of male and female students conducting chemistry practicals aided by simulation.

H_{02} There is no statistically significant difference in the result of oral viva of male and female students conducting chemistry practicals aided by simulation.

H_{03} There is no statistically significant difference in the result of practical manuals of male and female students performing chemistry practicals facilitated with simulation.

Significance of the Study

The quality of science education can be improved by applying innovative methodologies in science teaching. Laboratory work is essential for the development of skills related to the scientific concepts in students. The simulations have the potential to stir the interest of the student and also contribute to the development of concepts related to science. The nature of simulations also increases the motivational level results in more engagement of the learner. Simulation as an advancement in technology improves the comprehension level of the learner. The science laboratory equipped with simulation improves student performance along with increasing technology literacy. Teachers must keep their knowledge and abilities up to date in order to stay current.

Students can revise and practice practicals with the help of simulation according to their own caliber time and again in the laboratory as well as at home. The chemistry practical computer simulation is an educational resource available for self-study, used as an alternative in schools lacking chemistry laboratory resources and supplement laboratory work in schools having chemistry laboratory. As in simulations much of the practice is performed through computers, therefore, it saves the recourse, energy and time. The results of the study encourage the teachers to use simulated chemistry practical software for conducting practicals in order to improve the performance of the students in the Chemistry laboratory. Distance education may benefit from the use of simulation. To conclude, this study also pointed out many aspects and provided baseline data related to simulation and science teaching for further research.

Method

Nature of Study

The nature of the study was experimental and based on comparison of results of post-test (Practical examination) on the basis of gender in written paper, oral examination (viva) and practical manual. The study was divided into three parts: development, training, and implementation.

Developmental Stage

For the development of simulated practicals for Chemistry, the researcher consulted a software developer. The researcher chose ten Chemistry practicals for simulation after consulting with Chemistry teachers. The researcher created lesson plans based on the practical. The following steps were included in the development process.

1. Creation of plans for the lesson

2. Designing of simulation-based prototype for Chemistry practicals

3. Using a checklist and pilot testing, ensure that the prototype is of high quality.

4. Modification and enhancement of simulation-based the prototype

Training Stage

Research provided the training to use the simulations of chemistry practicals during two day orientation sessions with students and teachers.

Implementation Stage

The researcher, in cooperation with the institution's head, organized an eight-week Chemistry laboratory period for students in grades IX in one male and one female school. Fifty eight students of grade IX were comprised of 28 males and 30 females.

1. School No. 1, Group I (male).

2. School No. 2, Group II (female).

A post-test was created for the 10 practicals that were chosen. The subject specialists improved the items of the post-test. The pupils' performance was assessed by

two examiners using the Peshawar Board of Intermediate and Secondary Education's pattern. After then, the groups' results were compared using an independent t-test.

Instrument of the Study

The instrument for the study was post-test to discover the effect of simulation on the achievement of male and female in three primary aspects: written paper, oral viva and practical manual. The marking division and criteria of board of intermediate and secondary education Peshawar (BISEP) was followed.

Results

Comparison of result on the basis of gender in written paper performance

In order to identify the variance between the achievement of male and female students while performing practicals with the help of simulation, comparison was made between the result of written paper of male and female students of School No 1 (male) and School No 2 (female) by finding the t value by using independent sample t-test.

Table 1

Comparison of result on the basis of gender in written paper performance

	Group	N	Mean	S.D	t-value
Gender	Male	28	7.518	1.340	-.741
	Female	30	7.774	1.283	

The table 1 shows that there is no statistical variance in the performance/result of male (M= 7.51, SD=1.340) and female (M=7.77, SD=1.28) on the basis of written paper work at α=0.05, df =56 and p=.462.

Comparison of result on the basis of gender in oral viva

In order to identify the variance in the achievement of male and female students while performing practicals with the help of simulation, comparison was made between the result of oral viva of male and female students of School No 1 (male) and School No 2 (female) by calculating t-test with the help of independent sample t-test.

Table 2
Comparison of result on the basis of gender in oral viva

	Group	N	Mean	S.D	t-value
Gender	Male	28	2.46	.79	-1.53
	Female	30	2.73	.52	

The table 2 indicates that in oral examination (viva) there is no significance variance in the result of male (M= 2.46, SD=.79) and female (M=2.73, SD=.52) at α=0.05, df =56 and p=.130.

Comparison of result on the basis of gender in practical manual performance

In order to identify the variance between the performance of male and female students while performing practicals with the help of simulation, comparison was made between the results of practical manual of male and female students of School No 1 (male) and School No 2 (female) by calculating t-value.

Table 3
Comparison of result on the basis of gender in practical manual

	Group	N	Mean	S.D	t-value
Gender	Male	28	1.96	.189	.524
	Female	30	1.97	.254	

The table 3 indicates that there is no difference in the performance/result of male (M= 1.69, SD=.189) and female (M=.189, SD=.254) on the basis of practical manual at α=0.05, df =56 and p=.602.

Discussion

The researcher explored the effect of simulated software on gender by comparing the performance of male and female students of School No1 (male) and School No 2 (female) in written paper, oral examination and practical manual. The value of the t- test indicated that there is no variance in the academic achievement of male and female students at grade IX level.

Latest tools and technologies have motivational potential and enhanced students' achievement (Fraser & Walberg, 2005). Virtual laboratories and simulations are believed to be helpful for extending help in the learning of ideas and practical skills in science. Some researchers highlighted and even challenged this claim, that the girls are performing poorer than the boys (Gansmo, 2004; Gansmo, Nordli, & Sørensen, 2003; Lagesen, 2008; Topp, Nielsen, & Sørensen, 2002).

There is no significant difference between the performance of boys and girls exposed to computer based simulation teaching approaches. They further reported that this could be owing to the fact that male and female pupils in district co-educational schools mingle freely (Mihindo, Wachanga, &Anditi, 2017). Engagement with brighter students benefits weak students. When intelligent students, in contrast, present their thoughts in much better detail by exploring the concept themselves before sharing (Wachanga, 2002). In general, gender-friendly computer-based simulation training is an excellent instructional tool for closing the gender gap in chemical problem solving assignment. When female students achieve the same level of success in Chemistry as male students in secondary school, their performance will serve as a predictor of their choice of science-related subjects in higher education, which have traditionally been dominated by men. There are number of research studies which are in contradiction with the findings of current study. The eighty nine degree programs offered by University of Peloponnese's Department of Computer Science and Technology to find out the connection between gender and achievement in computer science subjects such as "Computer Technology and Computer Systems" and "Software Systems". The data analysis revealed that: (a) boys got slightly better grades in most of the major courses in computer technology, software system and computer systems, (b) this varies in the electives: girls have better average grades in some of these courses, while in others boys perform better, (c) boys achieved exceptionally good in laboratory based software and in core hardware courses which were not even opted by the girls, (d) there was a trend for girls to perform slightly better than boys in courses chosen by the majority of girls, with a greater percentage of "Excellent" results (Berdousis & Kordaki, 2015). An extensive study was carried out on 429 South African students and it was concluded that performance of students while using simulation software to perform various assignments is having no relation with the gender (Myburgh, Ankiewicz, &Van Rensburg, 2001).

Conclusion

The research intended to investigate the effect of simulation on the performance of male and female students while performing chemistry practicals at secondary level. It is generally perceived that females are afraid of and reluctant to use technology as compared to the male students. Many researchers quoted that technology is not gender neutral, therefore, researcher intended to find out the role of gender while performing chemistry practicals through simulation. The study was conducted in two public schools and the results of the study showed that there is no variance in the performance of boys and girls while performing practicals through simulations. In other words we can say that both male and female are equally benefited from the simulations .The comparison of post-test results were made between the performance of male and female students in three main areas i.e. written paper, oral viva and practical manual. To compare the groups independent t-test was applied which showed no difference in the performance of two groups resulting in the acceptance of null hypothesis. The problem of populated classrooms and limited resources can easily be managed with simulations in an effective way. An additional advantage of simulation is an element of interest and motivation. Therefore, it is concluded performing practicals in chemistry through simulation is beneficial for both boys and girls of grade IX. It is suggested that the application of simulated software is the solutions to many problems faced by the students while performing practical work in the chemistry laboratory.

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