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Full Length Research Paper

Empowerment of the school management team by secondary schools' principals in Tshwane West District, South Africa

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The South African education scene is characterised by principals who come from the apartheid era where they manage the school alone in an authoritarian manner. Old approaches to school management have changed because the society has also changed. There is a shift from top-down style of leadership to shared or distributed leadership which requires the empowerment of those in managerial positions in schools. The principal is expected to manage the school together with significant stakeholders. In this study attention was focused on the extent to which principals perform the duties of instructional leadership and how they empower the School Management Team (SMT) to execute instructional leadership. Additionally, the study aimed at finding out impediments that principals experience in the course of empowering the School Management team. The study used a quantitative method involving the use of a questionnaire. The study population consisted of 90 principals and deputy principals and 165 heads of department in Tshwane-West District. Data analysis consisted of descriptive and inferential statistics. The greatest challenge is the administrative workload experienced by principals. The study also found that rural principals perform the duties of instructional leadership more than the urban principals. Principals perform their duties well and this is good for the academic performance of learners.

Key words: School management, instructional management, empowerment, culture of teaching and learning, teaching and learning.

INTRODUCTION

Attention has been given to the instructional leadership of principals and the School Management Team mainly because of the decline in learners' achievement in national and international examinations, and the lack of a culture of teaching and learning in many schools.

According to Weeks (2012 quoting Nieman and Kotze), there are numerous dysfunctional schools in which the culture of teaching and learning has broken down. A study by Taylor (2007) reveals that the culture of teaching and learning has collapsed. Many reasons can be cited

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for the collapse of the culture of teaching and learning. Some of the reasons for the collapse in the culture of teaching are the failure of principals to practice instructional leadership effectively and lack of supervision of teaching and learning as there are no clear policies developed by the principal and the School Management Team (SMT) (Mogonediwa, 2008).

In the South African context, therefore, an important challenge is to practice instructional leadership so as to restore the culture of teaching and learning (Weeks, 2012). Instructional leadership focuses on managing teaching and learning as core activities of the school. An instructional leader concentrates all this/her energies on teaching and learning and is worried by poor examination achievement of learners. Thus Bush et al. (2009) maintain that the management of teaching and learning remains one of the fundamental activities for the principal and other school leaders. In spite of this, principals concentrate on other aspects of the school rather than on teaching and learning. Mestry (2013) contends that the principals' day comprise activities such as dealing with multiple teacher and student crises. In addition, Bush and Heystek (2006) aver that principals are mainly concerned with financial, human resource management and policy issues.

Studies by Phillips (2004) and Marishane (2011) point out that anything to do with teaching and learning is the responsibility of teachers and heads of department. This supports the premise that the principals should empower the heads of department in their duty as instructional leaders. This is because without the exercise of instructional leadership roles, the classroom becomes the major source of crisis in education. This results in ineffective teaching methods and weak subject knowledge all leading to poor quality schools (Fleisch, 2008). Concurrent with the management reforms and demands for the execution of various instructional leadership roles, principals are expected to provide opportunities for the deputy principal and the heads of department to fine-tune their practice as instructional leaders (Taole, 2013). Given the circumstances above, Gultig (2010) contends that it is important to ensure that South African schools hold principals accountable to empower deputies and head of departments with the skills to execute instructional leadership in order to attain quality education. Mestry (2013) argues that no one person can execute all the tasks facing principals and recommends that principals should empower management teams with instructional leadership instead of management functions.

Scholars such as Spillane et al. (2004) and Taylor (2009) outline the following three requirements for developing effective teaching and learning in schools:

1. Sound classroom practice from specialist teachers;
2. Sufficient and suitable learning material and
3. Sound and proactive leadership and management of learning.

The literature shows that the above requirements are not present in South African schools. For example, findings from the study conducted in the North-West Province by Van der Westhuizen et al. (2002) point out that grade 12 learners performed badly in the national examinations and one critical cause for this occurs where principals blame the teachers and parents for poor performance while parents blame principals and teachers. However, not only does this apply to the North-West province but also to the Limpopo Province.

Research by Bambi (2013) points to the fact that heads of department have a sense of their role as instructional leaders but are hampered by, amongst others, rigid educational frameworks, uneven distribution of power within the school, inadequate training and administrative duties. This implies that the principal should create conditions that allow heads of department to execute their role as instructional leaders. In this case, principals should embrace empowering and distributing leadership instead of clinging to power and trying to be supermen and superwomen who perform all duties in the school.

Extant research shows that instructional leadership of principals and heads of department is a popular topic among researchers. Some commentators focus on the challenges faced by rural principals in attaining the desirable learner achievement. These commentators point to the challenges faced by rural principals such as lack of funding, difficulty in recruiting highly qualified teachers, out-dated facilities and lack of technology (Du Plessis, 2017; Du Plessis and Mestry, 2019; Preston et al., n.d.). Other commentators compare the instructional leadership of rural school principals with that of urban school principals (Erwin et al., 2011). There is also a tendency of treating instructional leadership of principals separately from that of the heads of department without providing a bridge between the two. For example, Kwinda (2002), Zulu (2004), Lunenburg, 2010), Taole (2013), Mestry (2013) and Maila (2013) all studied the instructional role of principals while Bambi (2013) focused on the instructional leadership of heads of department; but, these studies do not indicate how principals can empower the SMT to perform instructional leadership effectively.

The literature also shows the narrative of a comparison between male and female principals in the execution of instructional leadership. Vedavaski (2017) concedes that there is a slight difference between male and female principals but does not indicate the nature of the difference. Burns and Martins (2010) examined the differences between male and female principals using the invitational theory and found that male and female principals differ in the source of their authority. Male principals derive their source of authority from their formal position whereas female principals derive their source from their expertise. Shakel et al. (2018) assert that

female principals consistently obtain higher ratings on instructional leadership when compared with their male counterparts. Burns and Martin (2010) conclude that effective principals will always be effective regardless of the gender of the principal.

In his study, Taole (2013) investigated the capacity of principals to provide instructional leadership and argues that principals need to free themselves from managerial tasks and delegate these tasks to the management team but this aspect was not further researched. Mestry (2013) and Maila (2013), however, recommend that the principal should delegate instructional leadership instead of managerial functions, to heads of department. In this study, it is argued that heads of department are instructional leaders because their job descriptions, according to Education Labour Relations Council (ELRC), resolution 8 (Department of Education, 2000), specifies that they should be responsible for the effective functioning of their departments and to ensure that the subject and the education of learners is promoted in a proper manner. Thus the principal should create conditions under which the heads of the department can effectively carry out their duty as instructional leaders.

Problem statement

Instead of concentrating on empowering management teams with instructional leadership to improve teaching and learning, most principals deal with financial, resource management and policy issues (Bush and Heystek, 2006). Recommendations from previous research indicate that principals do not understand their role in supporting heads of department in instructional leadership (Bambi, 2013). Findings by Kruger (2003) indicate a move away from the authoritarian modes of the past to a more collaborative approach and recommend that principals should make an effort to empower teachers (including deputies and heads of department) to enable them to fulfil their roles. The above means that principals are unable to fulfil their duty of supporting the SMT in executing their instructional leadership roles.

It is against the afore-mentioned background that this study seeks to investigate how principals empower the management teams in executing instructional leadership. The above question can be unbundled into the following sub-questions,

1. What is the difference between rural principals and urban principals and what is the difference between male and female principals in executing instructional leadership?
2. How do principals perceive their performance of the duties of instructional leadership?
3. How do principals empower the School Management Teams in executing instructional leadership?
4. What impediments do principals experience in empowering the School Management Team to execute instructional leadership effectively?

Aims of the study

The main aim of the study is to investigate how principals empower the SMT (deputy principal and heads of department) in executing their instructional leadership role effectively. This main aim is supported by investigating the following objectives:

1. To establish the difference between rural and urban principals, and male and female principals in executing instructional leadership
2. To investigate how principals perceive their performance of the duties of instructional leadership.
3. To establish how principals empower the School Management Team (SMT)
4. To investigate the impediments that principals experience in empowering the School Management Team

Theoretical perspectives

The study is premised on three theories, the theories of empowerment, instructional leadership and distributed leadership. The three theories are intertwined in that empowerment enables instructional leadership to be performed by the School Management Team (SMT) and distributed leadership is the vehicle that enables empowerment to take place. Basically, the principal should execute the duties of instructional leadership in order to empower the SMT to do the same. One cannot expect others to perform a duty that he/she is not able to perform. One of the ways in which empowerment can take place is through the exercise of distributed leadership.

Instructional leadership

The literature reveals various understandings on the concept of instructional leadership. Glanz (2006) indicates that an instructional leader ensures that the school offers the core function of the school, which is instruction.

Research studies indicate that the principal as an instructional leader should ensure that the school offers the core function which in instruction (Glanz, 2006). It is expected from principals to act as instructional leaders who know that successful leadership is one that supports successful teaching and learning. To this end, Bush (2007) posits that instructional leadership focuses on the direction of influence, managing teaching and learning as the core activities of educational institutions. In addition, Sharma (2012) agrees that instructional leadership is crucial in the development and sustenance of an effective school which focuses on learners' achievement.

Furthermore, Grey and Lewis (2012) hold a view that the introduction of instructional leadership may salvage failing schools. Therefore, the principal and the management team are held accountable for the academic performance of the learners and students. Principals are thus required to empower management teams with instructional leadership skills in order to enhance teaching, learning and learners' or students' performance.

Notably, Bendikson et al. (2012) distinguish between direct and indirect instructional leadership. These scholars explain that on the one hand, direct instructional leadership is leadership that focused on the quality of teacher practice, including the quality of curriculum, teaching as well as assessment. Whilst on the other hand, indirect instructional leadership refers to the creation of conditions for good teaching and teacher learning by ensuring aspects such as policies, routines, support high quality effective teaching and learning.

There are various conceptions of instructional leadership as alluded above. Nonetheless, there is convergence among many scholars about its role in supporting effective teaching and learning (Grobler and Conley, 2013; Naicker et al., 2013; Bhengu and Mthembu, 2014). These scholars agree that instructional leadership focuses on teaching and learning and on the behaviour of teachers in working with learners in order to achieve improved academic outcomes. It therefore means that the instructional leader's influence is targeted at learner's or student learning through the teachers. Putting it in a different context, Mitchell and Castle (2005) argue that instructional leadership entails the principals' actions which target improved learner outcomes. However, it is worth noting that such actions are more meaningful and bear fruits if the principal understands how to align these actions in ways that build structures to support leadership in others and influence instruction in ways that will result in increased learner's or student achievement.

In the context of the actions above, instructional leadership may be described by those actions that the principal performs, or delegates to others like the management team, to enhance optimal and effective teaching and learning including learners' or students' performance and achievement. It therefore means that the principal ensures maximum educational achievement by prioritizing instructional leadership quality within the school. Fullan (2002) advocates that instructional leaders should at all times strive towards excellence in teaching and learning with the primary purpose of improving learners' or students' achievement.

In empowering the SMT, the principals should work cooperatively with the staff in setting vision, goals and objectives in order to enhance and realize effective teaching and learning. Glanz (2006) contends that without a vision there is no direction or hope for the future. Van Niekerk and Wydeman (2008) assert that the vision of the school will always relate to the function of the school like an organization, which is ideal for effective teaching and learning. It stands to reason that a vision of the school deals with the desired future of the school and indicates the ideal that the instructional leader and the school personnel are striving to achieve.

In conclusion, Gupton (2013) avers that school leaders need to know their schools very well and to understand their staff and learners or students within their schools. Therefore, it is required that the principal should regularly involve the management team and the staff in the process of drawing up a meaningful vision for the school. The principal is also expected to inspire the management team including the staff to take ownership of this vision and to share the common goals and objectives, respectively (Blasé et al., 2010).

Empowerment theory

It seems empowerment has become a buzzword in corporate and educational circles, and has been applied in a number of fields including feminine literature, poverty alleviation efforts and community development. Hawkins (2002) postulates that empowerment is difficult to define but essential for learners, teachers and management teams (SMT). In this study, it has been used to explain the relationship between principals and the School Management Team. Hennink et al. (2012) aver that although empowerment has become a mainstream concept in discourse, its definition is elusive. This is further supported by Luttrell et al. (2009) by saying those who use the concept never attempt to define it.

As such the concept is defined differently by various commentators. The main idea is that empowerment is a process, not an event. This view of empowerment as a process is supported by Lord and Hutchinson (1993) who define empowerment as "processes whereby individuals achieve increasing control of various aspects of their lives and participation in the community with dignity". These authors further argue that empowerment can be understood as a process of change whereby the powerless people gain power to make decisions that affect their work. Cunningham and Gresso (1993) state that empowerment means helping people to take charge of their lives, inspiring people to develop feelings of self-worth and a willingness to be self-critical and reflective of their actions.

Hennink et al. (2012) postulate that empowerment "is the shift in the power structure or a process of transition from a state of powerlessness to a state of relative control over one's life, destiny and environment". Schermerhorn et al. (1997) view empowerment as the process by which school managers help others (management teams and teachers) to acquire and use the power needed to make decisions affecting them and their work. In the school empowerment means the transfer of power from the principal to the School Management Team (SMT) because the principal is seen as a powerful individual deriving his/her power for his/her position and referent power as a result of his/her expanse

knowledge of the education process. As such empowerment is seen as a process and an outcome. The outcome consists of the SMT moving from powerlessness to a state of relative control over their lives, destiny and environment (Hennink et al., 2012). Moreover the SMT gains access to valued social resources and valued social roles, which enables them to exercise authority and control over their respective departments.

The principal has the power to influence and coerce his/her subordinates to achieve the goals of education. This presents power as something which is wielded by those who have it and that it can be bestowed by one on another. In empowering the SMT the principal is therefore bestowing power on the SMT making them agents who have the capacity to act independently and make their own free choices (Luttrell et al., 2009). The distribution of power does not mean diminished power for who those who hold it but actually strengthens his/her power. This means that power shared is power gained. In a school the SMT gains control and power but does not diminish the power of the principal.

The principal's efforts to empower the SMT may be thwarted by people experiencing surplus powerlessness. People experiencing surplus powerlessness have internalised their oppression and the process of moving from powerlessness cannot be expected to emerge spontaneously from within and easily accept the offered empowerment. Structural rules and social forces may limit the degree of acceptance of empowerment by the people experiencing surplus powerlessness. Mosoge (2018) argues that the struggle against apartheid by teacher unions resulted in the challenge to the authority and power of principals. Thus, principals attempting to empower their SMTs may experience resistance to their authority and power.

The principal must find ways to motivate them to reach the entry level of empowerment by creating conditions that will foster the empowerment of those in managerial position (Lintner, 2009). One way of motivating those people experiencing surplus powerlessness is to create an enabling environment. Page and Czuba (1999) attest that, all too often, empowerment merely shifts management and leadership responsibilities to willing workers, who then work in a frustrating ambiguous environment. Hennink et al. (2012) describe an enabling environment as the existence of effective partnership with local and international structures. The enabling environment is created when the principal provides an open, friendly and supportive environment to teachers and often uses expert and referent power according to appropriate cases, situations and contexts (Elmazi, 2018). This is possible where the principal organises and changes the existing structure and adopts distributive leadership.

The principal should form a partnership with the SMT in managing the school because empowerment has less to do with coercion and more to do with synergy. This involves capitalising on individual and group capabilities, and casting off quite a degree of accumulated power. Higgs (2002) is of the opinion that empowerment for the management teams can only succeed in an environment where the desire for empowerment is greater than the desire for power. The enabling conditions cast the person in the role of an agent. In this way it encourages the individual to act independently and to make free choices. Empowerment can only have a lasting effect if it is transacted, not as a conflict of control and demand, but rather as a sharing of tools between trustworthy and responsible stakeholders.

Distributive leadership

Empowerment can only succeed when the principal creates an enabling environment by practising distributive leadership. The school consists of a community not only of the principal. This community includes parents, teachers, learners and non-teaching staff. This community shares an interest in and involvement with the same object (Foot, 2014). The subject of interest is the education of children that the community is interested in, seeing them succeed in their studies and further on in life. This suggests that education is shaped by social factors and group membership along with roles and positions each occupies in society (Van der Walt and Wolhuter, 2018). Historically, the community expected the principal to be authoritarian, to control everything in the school, to manage the school as his/her little fiefdom. That was regarded as a strong principal. However, the community nowadays expects the principal to be democratic and, according to the South African Standard for Principals (Department of Education, 2020: 3) "good principals do not act in isolation but lead and manage their schools democratically……"

Crawford (2005) emphasises that schooling is becoming more complex in structure and purpose and therefore organisational change and development will require more fluid and distributed forms of leadership. Indeed, in the current global discourse concerning alternative approaches to educational change, distributive leadership has received wide acclaim (Hargreaves and Fink, 2008). Orthodox leadership models are without any doubt criticised and seen as inadequate to sustain school improvement (Harris, 2005).

In a knowledge-intensive enterprise such as teaching and learning it is impossible to complete complex tasks without fostering implementation of distributed leadership responsibilities that enhance the empowerment of the management teams with instructional leadership skills (Hartly, 2007). Harris (2005) refers to distributive leadership as the contemporary leadership practice emerging in South African schools. It is worth noting that distributive leadership is becoming a norm believed to be both relevant and timely to empower management teams with management skills required to improve teaching and learning through appropriate implementation of

instructional leadership.

It is contested by Fletcher and Kaufer (cited in Leithwood et al., 2006) that in the distributive perspective, leadership is potentially enacted by people at different hierarchical levels in the organisation, in contrast to a view of leadership as a set of personal characteristics or attributes found in people at the top of the hierarchy. Remarkably, the distributive perspective accords opportunities and opens up the possibility for every person or individual (deputy principal, Head of Departments and teachers) to act and execute acquired instructional leadership skills as leaders and managers in one way or another (Goleman, cited in Harris and Muijs, 2005:28).

Gronn (2003), in particular, is helpful in conceptualising distributive leadership. Gronn (2003:85) draws upon the Activity Theory of Engestrom (1999), which emphasizes leadership as a collective phenomenon, the centrality of the division of labour, the interdependency of relationships and the notion of emergent activities It is in this context distributed leadership may be viewed as a social distribution of leadership where the leadership functions over the work of numerous individuals and the task is achieved through interaction of many leaders. In this instance, leadership is concerned with interdependency rather than dependency and embraces a variety of leaders in diverse roles who share leadership and management responsibilities (Harris, 2005).

RESEARCH METHODOLOGY

The research adopted the post-positivistic paradigm because it provides an alternative to the traditions and foundations of positivism towards conducting disciplined investigation (Onwuegbuzie et al., 2009). Post-positivist approaches assume that reality is multiple, subjective and mentally constructed by individual researchers (Salmani and Akbari, 2008). Therefore, post-positivist researchers assert that one can only approximate the truth and reality but can never explain it perfectly or absolutely. They concur with the notion that the world cannot be observed by complete objective and disinterested outsiders and that the natural sciences do not provide the model for all social research (Dezin and Lincoln, 2000). It can be concluded that the post-positivistic paradigm ensures that the value systems play an important part in the conduct of research and interpretation of data (Kumar, 2014; Hammersley, 2012).

A quantitative research method was considered most relevant and appropriate for this research study. Within the quantitative method, the survey method was adopted. Instrumentation consisted of a questionnaire developed by the researchers based on existing questionnaires; for example, Kwinda (2002), Zulu (2004) and Bambi (2013) in order to suit the present study. The questionnaire is structured into four sections:

Section A: Biographical information (Six questions))
Section B: Execution of instructional leadership by the principals (eight questions);

Section C: Empowerment of the SMT (9 questions)
Section D: Impediment in the way of empowering the SMT (6 questions)
Sections B to D were constructed by utilizing a four-point Likert scale ranging from small extent (1) to great extent (4). The Likert scale is useful when data need to be evaluated or quantified in a research survey (Leedy and Ormrod, 2010) or when a researcher wants to measure a construct (Maree and Pietersen, 2007). In addition, it is also useful when behaviour, attitude or other phenomena need to be evaluated on a continuum (Leedy and Ormrod, 2005:185). The rationale for selecting a four-point rating scale was to prevent neutral responses from the respondents; thus, ensuring that respondents either indicate a supportive or non-supportive response in accordance with the different question items.

Content validity was used in order to validate the question items of the instrument. According to Pietersen and Maree (2007), this kind of validity refers to the extent to which the instrument covers the complete content of the particular construct that it is set out to measure. The content of the questionnaire was validated through a rigorous application of the content gained from the literature study. To validate the questionnaire the researchers conducted a pilot study among two principals, two heads of department, and two deputy principals who did not form part of the selected respondents. They were chosen because they share similar characteristics with the selected respondents involved in the main research (Strydom et al., 2005). The pilot study was used to pre-test whether the question items are understandable, relevant and cover the principal's role adequately. Thereafter the researcher considered the comments emanating from the pilot study and adjusted the questionnaire accordingly. To further ensure validity, the questionnaire was also submitted to experts in the field of educational management to scrutinize and comment on it. These comments were used to improve the questionnaire.

To test the extent to which groups of question items of the questionnaire reflect the same attribute, internal consistency reliability was used. Groups of question items under the same heading were subjected to the Cronbach's coefficient alpha test. According to Struwig and Stead (2010), this test is suitable where individuals respond to items on multiple levels. Since the questionnaire consisted of groups of items, this test is suitable. All groups of question items with a Cronbach coefficient alpha of 0.80 were accepted (Pietersen and Maree, 2007).

The rationale for utilizing quantitative method in this research study is to ensure that participants have enough time to respond to questions than answering haphazardly, thus ensuring the validity of the findings made (Lund, 2005). In addition, the quantitative method ensures that the principles of ethics are maintained and upheld, for instance, keeping the identity of participants anonymous (Creswell, 2009). It is notable that in quantitative method, respondents are under no obligation to fill in the questionnaire (McMillan, 2003). The researcher assured respondents that anonymity will be upheld by not using their names or the names of their schools.

The study population consisted of the principals and deputy principals (n=110) and three or four heads of department (n=165) from a random sample of 30 schools in the Tshwane-West District. The return rate was as follows per category: Principals: 98.2%; Deputy-principals: 98.2% and Heads of Department: 83.0%. The response rate is large enough to draw valid and reliable conclusions (Ary et al., 1979). The reason for the high response is that the researchers personally handed out the questionnaire to the principals and requested them to distribute the questionnaire among members of the SMT. The researcher agreed with the principal about the date and time of collecting the completed questionnaires.

Data analysis consisted of inferential statistics such as the t-test and effect sizes.

RESULTS

Some of the data were subjected to a t-test to find out the

significant and practical differences between the construct of the questionnaire (section) and the biographical details. The following guidelines for interpretation of the practical significance of results (d-value) were utilized (Cohen, 1988),

Small effect: *d*= ≤0.2
Medium effect: *d*=>0.2 - <0.8
Large effect: *d*=≥0.8 (A result of *d*=≥0.8 was considered as practical significant)

The *t*-test was conducted for two pairs of groups: Male and female, and urban and rural principals. This answers the aim of comparing the performance of male and female and rural and urban principals on instructional leadership.

Section B (performance of instructional leadership) shows a significant practical difference of medium effect (0.33) in the responses of male and female respondents. The mean score of females is greater than the mean score of males. This shows that females hold the opinion that females perform the duties of instructional leadership more than males.

Section C (empowerment of the School Management Team) shows significant and practical difference of medium effect (0.51) in the responses of males and females. The mean score of females is greater than the mean score of males implying that females are of the opinion that the principal almost and always performs the listed duties of instructional leadership; while the males express an opposite opinion. This implies that females perform these duties more than the males.

In Section D (impediments to empowerment) there is no significant and practical difference in the opinions of males and females. The mean score of males is greater than the mean score of females denoting that males experience impediments more than the females.

The *t*-test for the group: Urban and rural schools

In Section B (performance of instructional leadership), there is significant and practical difference of medium effect (0.49) between the means of rural and urban schools. The mean score of urban principals is greater than the mean score of rural principals denoting that urban principals perform the duties of instructional leadership more that the rural principals.

Section C (empowerment of the School Management Team) shows significant and practical difference of medium effect (0.50) between the two groups. The mean score of rural principals is greater than the mean score of urban principals denoting that urban principals perform their duties more than the rural principals.

In Section D (impediments to empowerment) there is no significant and practical difference between the opinions of the two groups. However, the mean score of rural principals is smaller than the mean score of urban principals denoting that rural principals experience more impediments.

According to Salkind (2017: 212-213) there are two types of computations that can be done. For non-ordered groups, consisting of two independent groups, who were tested only once, the appropriate test is the *t*-test; whereas for ordered groups, consisting of more than two groups, who are tested only once, the appropriate test would be a simple analysis of variance. Thus in Tables 1 and 2, a t-test was used to compare two independent groups, being male-female and urban-rural. In Tables 3 to 4, the ANOVA was used to compare group D and group P, but now group H must be compared with group P in order to compare all groups with each other.

Table 3 shows that there is no significant and practical difference between the groups. Judging by the high mean scores a conclusion can be made that all agreed that the principal performs actions of the instructional leadership.

Thus, a *t*-test was applied to non-ordered groups and a correlation was computed. A simple analysis of variance was computed for 3 groups. The results are shown in Table 4.

In Table 4, there is no significant and practical difference between the groups. The mean scores are also low so that one can speculate that principals empower the SMT to a lesser extent. The results are shown in Table 5.

In Table 4, there is a significant and practical difference between the heads of department and as compared to deputy principals and principals. Judging by the low mean scores one may surmise that the groups are experiencing impediments.

DISCUSSION

The data presented in this section show that male principals are better than female principals as far as school management and empowering the School Management Team to perform instructional leadership are concerned. This is contrary to what the literature tells us. Female managers are presented as being more committed to supervisory duties than their male counter parts (Okarama, 2016). Moreover, the female principal is inclined towards people relationships and participative management practices which the literature present as suitable for empowering the School Management Team in executing instructional leadership. The research by Shakel et al. (2018) found that female principals consistently obtain higher ratings on instructional leadership when compared with their male counterparts. In comparing male and female principals, these authorsfound that female principals being more active as instructional leaders demonstrated transformational leadership more than men and were more experienced in academic and professional studies as a result of being

Table 1. The t-test male and female.

Section of the questionnaire	Group	N	Mean	Std. deviation	p-value	Effect size
Section B	Male	151	3.23	0.63	0.001	0.33*
	Female	93	3.46	0.54		
Section C	Male	152	2.58	0.71	0.001	0.51*
	Female	92	2.88	0.56		
Section D	Male	156	1.24	0.28	0.001	0.21
	Female	92	1.16	0.27		

*Effect size according to Cohen's d= value. Significance level is at p-value < 0.05.

Table 2. The t-test urban and rural school principals

Section of the questionnaire	Group	N	Mean	Std. deviation	p-value	Effect size
Section B	Urban	87	3.52	0.47	0.001	0.49*
	Rural	155	3.13	0.68		
Section C	Urban	87	2.42	0.48	0.001	0.50*
	Rural	155	2,50	0.72		
Section D	Urban	86	1.19	0.33	0.001	0.11
	Rural	154	1.23	0.25		

*Effect size according to Cohen's d= value. Significance level is at p-value < 0.05.

Table 3. How principals perceive their performance of instructional leadership.

Section	Group	Mean	Std deviation	N	p-value	D with effect size	H with effect size
Section A	D	3.3750	0.72	56	0.001		
	H	3.2030	0.57	137		0.24	
	P	3.5526	0.20	53		0.25	0.22

D=deputy principal; H= Head of department; P=Principal. Significance level is at p-value < 0.05.

Table 4. Effects sizes of how principals empower SMT.

Section of the questionnaire	Group	Mean	Std deviation	N	p-value	D with effect size	H with effect size
Section B	D	2.7933	0.82	56	0.001		0.18
	H	2.5858	0.59	137		0.25	
	P	2.7099	0.39	53		0.10	

D=deputy principal; H= Head of department; P=Principal. Significance level is at p-value < 0.05.

appointed to principalship after they gain more years of teaching experience. In support of these, Keser et al. (2014) state that female administrators are able to conduct their school work systematically, and that they are more ambitious and hardworking than males.

Despite the above findings female principals are faced

Table 5. Effect sizes of impediments that principal's experience in empowering the SMT.

Section of the questionnaire	Group	Mean	Std deviation	N	p-value	D with effect size	H with effect size
	D	1,3671	0.43	56	0.001		
Section C	H	1,1217	0.18	137		0.57*	
	P	1.2952	0.17	53		0.16	0.97

D=Deputy principal; H= Head of department; P=Principal. Significance level is at p-value < 0.05.

with a lot of negative circumstances. The society in which they live is riddled with stereotypes that women are less skilled than men; the patriarchal society forces them to play the role of being mothers, that they lack self-confidence and have no courage to struggle with men (Keser et al., 2014). That is why, perhaps, Okarama (2016) concludes by saying that given chance female principals can make better managers. The females investigated in this research seem to fall under the above said category.

Another finding is that principals of rural schools perform duties of instructional leadership more than the principals of urban schools. In tandem with this, rural principals experience less impediments in empowering the School Management Team. The above results are baffling in that the literature shows that rural schools face a lot of challenges. Du Plessis (2017) lists the following as barriers to effective management in rural schools: lack of funding, difficulty in recruiting and retaining highly qualified teachers, outdated facilities, limited technology and a community culture that does not value higher education. Data from this research show that despite these challenges principals in rural schools perform better than principals in urban schools on the level of managing the school and on the level of empowering their SMTs.

Starr and Simone (2008) complain about the one-size-fits-all policy of the government, the heavy workload of the rural school principal, who must manage the school and teach. Linton (2014), in his thesis, compares the rural school principals and the urban school principals and finds that the scale of problems is skewed towards the rural school principal. Perhaps the rural school principals in this research understand that performing their jobs is not just about what they do but how they do it (Starr and Simone (2008). These authors further say in rural areas there is strong community linkages and shared leadership practices. Possibly, the rural school principal practice shared leadership and involved the community in the governance of the school.

As noted above, the heads of department differ with the deputies and principals. This means that the heads of department view the impediments in the way of empowering the School Management Team as being not great and the principals and deputy principals view the impediments to be somewhat great. This is understandable from the view point that heads of department may not be aware of the impediments that principals encounter in efforts to empower them because of their position in the hierarchy of the school. The close proximity of the deputies to principals makes them aware of the impediments that are experienced by principals.

Another view of the difference between heads of department and principals and deputy principals may be found in the way heads of department accept or reject empowerment opportunities offered by the principals. The advent of teacher unionism has resulted in tension between the principal and teachers with the result that heads of department may not accept opportunities of empowerment offered by the principal. The resistance of teacher unions against government policy has been translated into a challenge to the authority of the principal that has made it difficult to delegate duties to the heads of department. Hence the heads of department do not appreciate the impediments facing principals. Mosoge (2018) argues that principals consider experiencing resistance to their authorities to be very great while their SMTs consider it to be moderately great.

No differences were found between principals, deputy principals and heads of department in the performance of instructional leadership by the principal. This shows that the deputy principal and the heads of department have confidence in the principal as an instructional leader. Lee and Nie (2015) refer to the research by Ho and Chen (2009) who indicated that principals often work closely with heads of department. As a result, heads of department emulate their principals. The principals have shown commitment to distributed leadership and ultimately this has rubbed off on the SMT achieving a strong team of professionals.

Also no differences were found between the principals, deputy principals and heads of department as far as empowering the SMT is concerned. Addi-Racah (2009) maintains that teachers do not sense much freedom from administrative surveillance and that they have little influence over school policy, planning, programmes and budgets. It appears the SMT in this research feels the opposite. Empowered SMTs are ready to promote common goals and take on added responsibilities and accountability. It seems the SMT's perceptions about empowerment are changed into real perceptions about empowerment and make them feel empowered. In the

research by Ho and Chen (2009), as quoted by Lee and Nie (2015), leadership of principals correlated with the leadership performance of their heads of department showing a possible alignment between the school leaders at different levels thus ensuring the effectiveness of collective school leadership.

Conclusion

In concluding this article, it should be said that policy of the government requires principals to manage the school together with significant others including teachers, parents and, in some cases, learners. This makes it imperative for the principal to empower the management team in order to achieve synergy in his/her management. It may be assumed that coming from a background of authoritarian style of management, principals will find it difficult to adopt distributed leadership, which is the recommended style to foster empowerment of the management team. This article shows that this assumption does not receive any support because principals show an uncanny way of empowering the management team.

Furthermore, this article revealed significant differences between the management of males and females and between rural and urban schools. This alerts the service providers of management training to provide differentiated courses for each group of principals and not to adopt a one-size-fits-all approach to training. It also means when conducting evaluation the contextual factors imminent at the school should be taken into consideration. It is suggested that specific training should be conducted for female principals as they experience more hardship than their male counterparts. However, this article is not the last word on empowerment of the management team. Further research could use a larger sample differentiated according to different groups of principals. This means each group must respond to a different questionnaire tailor-made for each group. This would reveal deep-seated challenges for each group of principals. Research could also be conducted to gauge the effects of empowerment on teachers and learners.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests

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Career aspirations and decision making self efficacy: Secondary School Students'assessment based on KCSE exams in Kenya

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The purpose of the study was to determine career decision making self efficacy by assessing career aspirations and attainment in National examinations. The objectives of the study were to: Find out the students sources of career information, assess career aspirations, and to determine career decision making self efficacy. A descriptive survey research design was adopted for the study. The study population consisted of 4200 students. A sample size of 420 was selected using stratified random sampling technique. Questionnaires and document analysis guide were used for data collection. Reliability was computed using test re-test and the co-efficient was 0.7. Content validity was ascertained in literature. Data was analyzed using descriptive statistics. It was noted that 55.08% of the students relied on their career masters for career guidance. Career aspirations were presented in a table. It was found that the students had poor career decision making self efficacy. Only 10.6% of the students attained the cut off points for their career aspiration. The study may be useful to teachers, counselors, administrators and parents who will be able to assist students in making worthwhile career choices.

Key words: Career choice, academic achievement, career aspirations, career decision making self efficacy, secondary school, Kenya Certificate of Secondary Education (KCSE) exams, career interest, national exams.

INTRODUCTION

In Kenya, all learners undergo compulsory education up to high school level. This gives them an opportunity to sit for the Kenya Certificate of Secondary Education (KCSE) exam which determines what career students can pursue as well as the level at which they may begin. There is provision for starting at the artisan, certificate, diploma or degree level and progressing upwards (KUCCPS, 2019).

Career guidance refers to services and activities intended to assist individuals at any point in their lives to make educational, training and occupational choices as well as manage their careers (KUCCPS, 2019). This will require the concerted efforts of class teachers, subject teachers, career masters and the Guidance and Counselling Department or Committee. Guidance and counseling must be started as early as when students join form one. Indeed (Ombaba et al., 2014) reiterate

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that career education should be part of a student's curriculum from the moment she/ he enters school. At this level the school exposes students to a wide variety of subjects. Students will later choose eight subjects using KCSE guidelines. By the time students are choosing these subjects, they consider their preferences, capabilities and subject combinations in tandem with the 8-4-4 system requirements (Wangari, 2018). There is need for career masters to help students gauge their academic abilities early so as to make the best available career choices. Some students have career aspirations which need higher marks, than their academic abilities, leading to poor career decision making self efficacy.

Statement of the problem

Kenya has made progress in provision of career guidance, although the direction of movement it has taken is to give secondary school students information on the courses offered in tertiary institutions with little support on how to match their skills, interests and values to the courses and a specific career path. To a great extent, the most important determinant for a career path of most students in Kenya is their academic achievement in KCSE. Student's need guidance on how to predict their academic achievement in KCSE based on their present achievement in school in order to be able to make wise career decisions. This study was therefore crafted to find out if the students' academic achievement enabled them to qualify and begin the journey on their career path towards their career aspiration. It is a confirmatory study to find out whether students have career decision making self efficacy.

Objectives of the study

With the continued emphasis on career guidance the current study sought to find out the level of career choice exposure. In this respect, the objectives were:

(i) to find out the students' sources of career information.
(ii) to find out the students' career aspirations by type of school and
(iii) to determine the students' career decision making self efficacy.

Significance of the study

This study may be useful to career masters, mentors, teachers and administrators as it emphasizes the role of aptitude in determining career choices for higher education especially in circumstances where there are financial constraints. The study may also be useful to students as it may make them become aware of the need to ensure they understand their academic capabilities and use it to choose the best career choice options that are available.

Limitation of the study

The study was based on descriptive survey research design, of the cross sectional approach where data is gathered at one point in time. The results on career progress cannot be deemed conclusive because learners keep progressing in their career paths and may still achieve their aspirations through a longer route.

Sources of career information

Finding out the sources of career information is important. Onuoha et al. (2013) conducted a study on sources of career information among 200 students in Nigeria. They used questionnaires to collect data and found that parents, teachers and churches were their sources of career information. On the other hand, Theresa (2015) conducted a study in Ghana among 400 students and found that 31.6% of the parents, 7.4% of the class teachers, 3.6% of the counsellors influenced the students' choice of subjects. Majority of the learners 47.6% made career choices out of their own volition. Keller and Whitson (2008) in their study found that parents played an important role in career choice. In Kenya, KUCCPS established that close to 65% of the 2017 KCSE candidates selected their courses based on influence drawn from their parents, friends, teachers and relatives.

Career aspirations

Obura (2007) conducted a study among Kenyan students and found that engineering, law, medicine and teaching accounted for 64.2% of the male students' choices as well as 61.7% of the female students' choices (Carranza et al., 2009) in their study of Mexican adolescents found that there was a high perceived parental educational involvement with regard to career aspirations. The present study sought to find out the career aspirations of students who were in their final year of study.

Career decision making self efficacy of students

Career self efficacy is the belief a student holds about his academic ability with regard to his or her career aspirations. Self efficacy affects career choice behavior jointly with contextual factors as well as personal attributes (Tang et al., 2008). Taylor and Betz define career decision making self efficacy as the extent to which individuals believe that they can evaluate, collect career information, select goals, make plans and solve problems relevant to career decision making (Wang et

al., 2010). The main hindrances to career decision making self efficacy are students' interests, talents, skills and subject strengths (KUCCPS, 2019). In Kenya, since the introduction of self- sponsored students who pay fees at the university a number of students may be able to get into careers of their interest since they have financial resources.

Oigo and Kaluyu (2016) found that ad hoc methods used for career guidance had no effect on student career decision making. They concluded that other studies carried out where there were established career guidance programs with systematically arranged activities that included career decision making, career exploration, career maturity and career self-efficacy have shown more positive effects.

MATERIALS AND METHODS

Research design

Descriptive survey research design was used for this study. Descriptive survey research in education involves making careful descriptions of educational phenomena as it currently exists (Mertler and Charles, 2012).

Population, sample and sampling technique

A sample constituting 10% of a target population of 4200 students was used, giving a total of 420 students (Nkpa, 1997). The questionnaire response rate was 90% giving a total of 380 questionnaires. A total of 11 schools were used in the study. Stratified sampling technique was used whereby stratification was done by school type. The schools were classified as Boarding, Provincial schools, Boarding District Schools and District Day schools. The schools were divided into 3 categories:

(i) Category 1 was Provincial schools in which most of the students have high academic abilities going by the mean score of the learner.
(ii) Category 2 was District schools in which the students have average academic abilities as well as financial resources.
(iii) Category 3 was District day schools in which majority of the students have below average academic abilities and whose parents belong to the low socio economic status.

Data collection procedure

A research permit was sought from the Ministry of Education. Data was collected in two phases. The first phase of data was collected in the months of September and October during the final term of the fourth and final school year. The students filled in the questionnaires in approximately 20 min. The second phase of data collection was carried out in March as soon as Kenya Certificate of Secondary Education Examinations (KCSE) which was also the summative evaluation results were out. It involved collecting the KCSE mark lists from schools which participated in the study and corroborating the questionnaires with the grades.

Data analysis

Data was analyzed using SPSS version 20. Frequencies and percentages were used to summarize the data. Qualitative data on career aspirations was organized into themes and categorized. The data was then presented in tables. The students' performance in summative evaluation which was the result of KCSE results was used to ascertain whether the student made the cut off points used to assess the students career decision making self efficacy.

RESULTS AND DISCUSSION

The data was made up of 380 students in form 4. Their mean age was 18.38 years with a standard deviation of 1.078. The number of boys was 220 whereas girls were 160. Mean scores for students in the three categories of schools were as follows:

County Boarding Schools had a mean of 7.98: Subcounty Boarding Schools had a mean of 5.94 and Subcounty Day Schools had a mean of 5.02. The mean scores for the three types of schools were in line with their entry marks in form one. The best performing students are usually admitted in National Schools of which there was only one in the county. However, the school was situated beyond the scope of the area of study. The other high performers are admitted in County boarding schools. This is followed by Subcounty boarding schools. Most of the parents who take their children to these schools are of middle income and most may struggle and take their children through higher education if they pass their exams. Last but not least we have parents who take their children to Subcounty day schools. Most of these parents are poor and majority live in the rural areas. Most of the students in this school category got very low marks in the KCPE examinations. However, there may also be some pupils who performed well but because their parents cannot afford to take them to boarding schools, they end up attending the day schools.

The first objective was to determine the student's main source of career information

The results show that, the students' major source of career information was the school. The students who derived their career information from the school were 55.08%. This reveals that as much as other sources are available for career information, most students rely on their career masters for information. The results also indicate that 9% of the students got career information from their parents, 23% got career information from the newspapers, 9% got career information from the internet and a total of 3.92% got career information from multiple sources. This result is not in agreement with Keller and Whitson (2008) who found that parents played an important role in career choice. This finding is important in that school principals need to ensure that their career masters are well trained and equipped. It also informs policy makers on the importance of enforcing policies

Table 1. Career aspiration by type of school.

Career aspiration	County boarding		Subcounty boarding		Subcounty day	
	f	%	f	%	f	%
Non Response	16	13.2	3	2.8	5	3.3
Accountancy	15	12.4	11	10.1	13	8.7
Teaching	2	1.7	5	4.6	16	10.7
Others	24	19.8	5	4.6	25	16.7
Business	10	8.3	2	1.8	8	5.3
Engineering	7	14	23	21.1	11	7.3
Forces	0	0	4	3.7	6	4.0
Journalism	3	2.5	11	10.1	16	10.7
Law	22	18.2	11	10.1	16	10.7
Medicine	12	9.9	13	11.9	17	11.3
Nursing	0	0	5	4.6	17	11.3
Total	121	100	109	100	150	100

Table 2. Students who qualified for the courses they aspired for.

School F	N	Mean	SD	B	%
1	379	6.46	1.753	40	10.6

Where N = Total number of students, B = Total number of students who qualified to do the course they aspired for.

related to guidance activities.

The second objective was to determine career aspirations

Table 1 shows career aspirations of students which represents interest. Table 1 shows that most of the students chose law, medicine, engineering and accountancy as their major career choices. These careers accounted for 44% of the students' choices. This pattern is in agreement with Obura (2007) who also found that engineering, law, medicine and teaching accounted for 64.2% of the male students' choices as well as 61.7% of the female students' choices. With regard to availability of financial resources as pointed out earlier, the students who came from Subcounty Day Schools are more likely to have financial constraints. This therefore means that they may not be able to pursue their career interests as expressed in Table 1.

With regard to performance in examinations, it is expected that County boarding schools would perform better than Subcounty day schools yet there are more students who wish to become Doctors and Engineers from Subcounty Day Schools than County boarding Schools. This therefore means that the students base their career aspirations on interest as opposed to aptitude. The current study also analyzed career decision making self efficacy by investigating achievement of career aspirations by examining cut off points. The current study examined the cut off in regard to academic achievement depending on one's career aspiration. To determine career decision making self-efficacy, each students aspiration was evaluated against their achievement. The results are shown in Table 2. From the results only 40 students (10.6%) qualified for the career they aspired for. This therefore means that students have a very low career decision making self efficacy. Obura (2007) looked at the relationship between students' career aspirations and performance in exams. Students careers were classified into Arts based, Biological Sciences and Physical Sciences. She compared those with Grade A, B, C, and D using trial exams and got χ = 15.295 6 degrees of freedom ($p < 0.05$) a significant relationship.

Conclusions

It was concluded that more than half of the students get their career guidance from the school career master. Students had a variety of career aspirations. In the present study it was concluded that students did not have career decision making self efficacy.

Recommendations

The following recommendations were made:

(i) schools particularly strengthen their career guidance departments to satisfy the large number of students seeking specialized career services.
(ii) learners are exposed to a greater number of careers that resonate with the changing times.
(iii) Teachers help learners predict their overall performance in KCPE as well as subject performance based on school exams to enable them make prudent career choices.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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Evaluation of asynchronous piano education and training in the Covid-19 era

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The aim of this study is to examine the success of music students in asynchronous piano education during the distance learning process in the spring semester of the 2019/2020 academic year in the Covid-19 outbreak. Participants of the study consisted of 34 students studying at Giresun University, 37 students studying at Niğde Ömer Halisdemir University and 32 students studying at Kırıkkale University. Various quantitative and qualitative research techniques were used depending on the aim and sub-problems of the study. Hence, this research was carried out with a mixed method. Besides, this research is an experimental study in one dimension. In order to collect the data of the research, the "track deciphering form" "track technical form" and "track acceleration and musicality form" developed by Yücetoker were used in the assessment of the play records received from the students, and the midterm and final grades of the students were received from the student information systems of the relevant universities. Findings obtained from qualitative data were analyzed by the arithmetic mean, and findings obtained from quantitative data were analyzed by the paired-samples t-test. In light of the findings, it was concluded that the students did not gain enough deciphering, technical study, and musicality behaviors in asynchronous piano education in distance education, and their distance education achievement scores were lower than the face-to-face education achievement scores. Various suggestions were given in light of these results.

Key words: Distance education, Covid-19, piano education, music education.

INTRODUCTION

Existing distance education systems offer the opportunity of global education (benefiting from the educational opportunities of universities through distance education) and global communication (the opportunity to communicate effectively among themselves) for students and teachers living in different countries of the world. Contributing to the increase in the significance of distance education, these two opportunities also allow both students and teachers to involve in independent, individual, or collective working environments through programs. Distance education has an important place in the education system (İşman, 2011: 4).

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Distance education is a term that brings together the elements of "teaching and learning". Distance training highlights the institution and the teacher. It explains the course development process of a distance institution that prepares learning materials for students. Distance study is a student-oriented term that tends to neglect the role of the institution. The process is evaluated from the student's perspective. Distance training and distance study (or distance learning) are two halves of the distance education process (Kaya, 2002: 10). In this case, Işık and Güler (2008 as cited in Yungul, 2018: 1336) define distance education as "an institutional education activity where students, teachers and teaching materials in different places are brought together through communication technologies".

According to Romitsovsky, in order to carry out remote educational activities, it is necessary to determine a targeted model of training, develop, support technological infrastructure. The models used are divided into 2 as synchronous and asynchronous (cited by Demir, 2014: 205). In synchronous education, where students and the teacher have the opportunity to communicate with each other live, the lesson is conducted in a virtual environment. By virtue of this method, students may ask questions about issues that are not understood live, get the opportunity to discuss with each other. In asynchronous education, where the student can access courses at any time and from any place, the course is followed with previously uploaded materials (video, audio recording, etc.). In this method, students cannot ask questions about topics that are not understood because they are not in direct contact with the instructor (Serçemeli and Kurnaz, 2020: 42).

In the report published by YÖK, it has been stated that the goal of distance education is “to increase the effectiveness of education through the interactive environment in which information and communication technologies are provided, multimedia opportunities and the ability to access unlimited information”. Distance education, which is becoming increasingly important, especially for working people, and an effective way to reach up-to-date information, will become even more widespread along with technological advances. Thus, access to distance learning applications will be easier, the interaction between teachers and students will increase, more people will get a more convenient and easier speed of study, getting rid of restrictions (economic, geographical, social, sexual) (cited by Demirel, 2009: 701).

According to Karasar, thanks to the internet, the concept of “place” has ceased to be a concept that determines whether to use educational services because on the internet, ”one place“ is ”everywhere". “Locality”, which is firmly adhered to in the curriculum, is about to abandon its throne to the concepts of “globalism” or “universality” (Kahraman, 2020: 48).

Distance education provides a number of opportunities for individuals and society, as well as some limitations. It may not easily provide communication and interaction in face-to-face training. The socialization of students who receive education through distance education may be prevented and weakened. While distance education can work especially in the activities of theoretical courses and disciplines, it may not work effectively in practical courses and disciplines. Deficiencies can be observed in gaining skills and attitudes through distance education (Akyürek, 2020: 7-8).

Visual Arts (painting, sculpture, etc.), Auditory Arts (music, etc.), Dramatic Arts (opera, ballet, etc.), namely Fine Arts, are among the applied courses that are thought to be negatively affected in the distance education process. According to Rees, music educators have been slow to embrace the internet-based distance education process. The situation that instrument training, which is a branch of music education, continues in a practical, master-apprentice relationship and face-to-face environment, in other words, the ossification of this method is an important factor for those who want to receive music/instrument training and music educators to stand aloof from distance education (cited by Aksoy et al., 2020: 950).

According to Özen (1996: 20), instrument training should be seen as a way for the student to establish a sincere connection with music, tend to professional and amateur music and gradually acquire music as a profession. In addition, Uçan (1997: 11) defines instrument training as "one of the most important and meaningful dimensions of music teaching at all levels for whatever purpose, whether general, volunteer or professional." Given these definitions, instrument training is an important musical education at all levels. Piano education refers to one of the sub-branches of instrument training.

Based on the definition of violin education, piano education can be defined as the process of making changes and creating changes in cognitive, affective and kinesthetic behavior of individuals through their own life (Günay and Uçan, 1980: 8).

Regardless of the type of education given, it is necessary to pay attention to many factors in piano education: the correct sitting, the correct grip of the hand, arm and fingers, applying force to the keys as required, the correct reading of notes, rhythmic accuracy, the correct finger number, coordination of both hands, pressing the right key, nuance accuracy, tempo accuracy, the correct functioning of techniques like legato-staccato-portato, the correct interpretation of musical terms, the accuracy of musical expression, performing all items and memorizing the work from beginning to end (Akbulut, 2020: 1834).

Piano education, besides its technical and musical achievements, has a very important place for music teacher candidates.

The most suitable and useful instrument to be used as

an instrument in music teaching is the piano. There is no intonation difficulty or disorder in this instrument, it has a fixed pitch. It sounds right from where the finger is pressed (provided the piano is not out of tune). The instrument has wide sound limits. It has a wide range of voices capable of reproducing the sounds of both women (or children), men, and instruments. In the piano, any agility is possible. Short-value sounds are easily made. It has a harmonic-polyphonic character; it is the most suitable instrument for polyphonic ear training; It is a harmonic accompaniment instrument. The reduction of all kinds of polyphonic pieces can be carried out. Choral and orchestral pieces can be played. It is suitable for analyzing large pieces. It has rich literature and so on. Because it is a heavy and expensive instrument with all these qualities, the desired place, time, and number cannot be provided immediately. It necessarily requires a private music hall or music classroom at school (Yönetken, 1952 as cited in Say, 2011: 69).

Piano education is considered an instrument education accepted all over the world. In our country, it is carried out through institutions of professional music education (Schools of Fine Arts, Faculties of Education, Conservatories, Faculties of Fine Arts, etc.), as well as institutions providing excellent music education (activities like courses, private lessons, concerts).

In faculties of education, “Teacher training programs, which have been rearranged since the 1998-1999 academic year, have been implemented. In the restructuring efforts, the programs of education faculties that train teachers for primary education have been shaped to meet the demands of eight-year compulsory primary education. " Piano lessons are given for 8 semesters pursuant to this formation. The name of the lesson given in the second semester of the 4th grade is “Piano and its Teaching” (YÖK, 2007a).

“By the end of the nearly 10-year period in the 1997 configuration, attempts have been made for it to be revised by considering the deficiencies in the 1997 configuration, and accordingly, some arrangements have been done in the vocational knowledge courses in both primary and secondary education field teaching programs.... Considering the structural changes in the Turkish education system, social needs and demands, the restructuring of education and educational sciences faculties in terms of departments, and the re-updating of teacher training undergraduate programs has emerged as a necessity.”(YÖK, 2018b). The piano lesson, which had been 8 terms previously, has been reduced to 2 terms, to be given only in the first year pursuant to this regulation (YÖK, 2018c).

The positive or negative effects of this educational instrument, whose education has been reduced from 8 to 2 terms, on music teacher candidates should be considered and researched. However, before the first graduates were even given under the new program, we have faced an unexpected global crisis that has caught all countries unprepared.

Since the COVID-19 outbreak, which started at the beginning of 2020 and is still continuing, has been experienced for the first time in our country and in the world, it is being seen that there are problems in producing solutions to this outbreak (Kahraman, 2020: 47).

Problem status

COVID-19, a large family of viruses that can cause disease in animals and humans, is a virus first identified in China's Wuhan province on 13.01.2020 in late December. The disease, which was detected in those found in the seafood and animal market in this region, was transmitted from person to person by respiratory tract and spread to other cities, other states and other countries of the world (The Ministry of Health of the Republic of Turkey, 2020).

The measures taken to control the virus spreading to all countries of the world have stopped the wheels of the international supply chain; It has created various results and performance changes in social, health, education, sports, cultural and tourism activities and systems such as economic, security, food, supply chain, communication, transportation (ThinkTech, 2020).

One of the areas that the COVID-19 epidemic caught off guard and almost shocked about what to do is undoubtedly the field of education. Formal education was the first area of mass activity to be interrupted when quarantine days began in the countries. Education and training institutions were closed. In the field of education, the educational process of more than 1.57 billion students in the world has been interrupted. Due to the prolongation of the process, discussions have begun on how to continue. Many countries with partial experience, even in narrow areas, preferred distance training as a way of continuing education and training activities. While some countries prefer to abstain from this issue or be content with partial practices, some countries, including Turkey, quickly mobilized their distance training infrastructure to carry out educational activities at all levels (Karakaş, 2020: 565-566).

Due to the COVID-19 outbreak, which has been declared as a pandemic by WHO on 11.03.2020, it was decided to suspend education for 3 weeks starting from 16.03.2020 in all higher education institutions in our country on 13.03.2020 (YÖK, 2020d).

During this period when the distance training opportunities and capacities of the universities were determined, the *Distance Training Roadmap* was determined on 17.03.2020 by a delegation consisting of relevant experts from universities and YÖK. Necessary regulations and decisions to be taken in 5 main areas, namely *Legislation, Infrastructure, Human Resources, Content,* and *Implementation,* started to be implemented

in this roadmap (YÖK, 2020e).

In line with the statements made, it was decided that the educational process in higher education institutions in Turkey be continued only with distance education as of 23.03.2020. In this context, universities that did not have a "Learning Management System" or had deficiencies in infrastructure were given the opportunity to cooperate with other universities with distance education experience and to benefit from each other's infrastructure opportunities. It was also decided to provide support by Anadolu University, Atatürk University and Istanbul University upon request (YÖK, 2020f). The distance education process, which started in line with the application methods (synchronous - asynchronous) determined by the universities within their own structure and the academic calendar they reorganized, had been completed at the end of about 8 or 9 weeks.

During this period, the vast majority of universities continued distance education practices in asynchronous form. This clearly shows that distance education systems should be developed in terms of infrastructure (Can, 2020: 35). The distance learning system had often been used for theoretical courses prior to the outbreak. Medicine, Fine Arts, most engineering fields, as well as applications that require dexterity or physical teacher intervention on materials, could not be included in the distance education system, as it required special education.As instrument education is also a form of education that requires dexterity and physical intervention of the teacher, there is no instrument education included in the distance education system in Turkey. For all these reasons, in the post-epidemic period, that is, in the spring semester of the 2019-2020 academic year, training in theoretical courses can be easily applied, while it has been a little difficult to implement in practical courses" (Artaç, 2018: 303; Kahraman, 2020: 48).

Due to the limitations such as not being able to provide face-to-face education relations easily in the distance education process, not being effective in performing skills and attitude-oriented behaviors, not being able to provide sufficient assistance to students who do not have the habit of self-learning and are helpless, students cannot benefit from practical courses adequately (Kaya, 2002: 20).

When asynchronous education, which increases lack of communication and decreases mutual interaction, is added to the situation of having a minimum of 2 people in a lesson, the time allocated to a student decreases, and piano education often requires a superhuman effort to achieve its purpose. Therefore, according to Bolat and Akıncı (2020: 341), in music/instrument education, which is a discipline in which cognitive, affective, and psychomotor skills are at a high level, the educator and the student have to plan and advance the process together.

In theoretical lessons, it can be seen as a useful element for the student to reach information whenever and wherever he wants. However, this element in instrument (piano/individual instrument) training, which is an applied lesson and must be carried out in a certain discipline, creates a negative situation for both the teacher and the student, renders the distance education process, which does not require attendance, to a great extent useless, and unfortunately some students become the "losers" of this process. Taking everything into consideration, it can be said that it is obvious that the success of the "piano" course, which is a practice lesson in which asynchronous education is applied, is obvious. In this direction, the aim of this research is to examine the success status of music students in asynchronous piano education conducted in the distance education process. In order to achieve this goal, answers to the following questions are sought:

Of the works performed by music students in piano education during asynchronous distance education,

1) What are the success situations in the sight-reading stage?
2) What are the success situations in the technical stage?
3) What are the success situations in the musicality and acceleration stage?
4) Is there a difference between the success grades of the piano education of the students after their face-to-face education in the fall semester of 2019-2020 and the grades of piano education after the distance education in the spring semester of 2019-2020?

METHODS

Various quantitative and qualitative research techniques have been used depending on the problem and sub-problems of the research. That being the case, this research has been carried out by mixed method. Besides, this research is an experimental study with a dimension.

Quantitative methods are one group pretest posttest experimental design and a single screening model from the general survey model. Experimental design models are accepted as controlled research in which theories can be developed as a result of determining the relationships between variables, and are accepted as the most reliable research due to the accuracy of its results (Ural and Kılıç, 2006). Among these, the one group pre-test post-test experimental design model to be used in this study is a model that can be applied to a random group of independent variables, requiring both pre-and post-experiment measurements (Karasar, 2006).

Another model to be used in the research is the screening model that aims to describe a situation as it was in the past or a situation that still exists as it is. The single screening model to be used in this research is for the purpose of determining the formations of variables, individual, type or quantity.

Participants

This research has been carried out through distance education in the spring semester of 2019-2020. The participants of the study were 34 students who studied at the Music Education Department of Fine Arts Education Department of the Faculty of Education of

Table 1. The means of the success situations of the students at thesight-readingstage.

Sight-reading criteria	n	x̄	Std. deviation
Finger Numbers	103	**1.97**	1.061
Staccato playing	103	2.15	0.750
Rest signs	103	2.30	0.937
Constant tempo	103	2.33	1.080
Number of measures	103	2.46	1.312
Equipment Sign	103	2.50	1.162
Legato playing	103	2.86	1.038
Notes	103	3.04	0.809
Rhythms	103	3.59	1.023
Starting position	103	**3.94**	0.988

Giresun University, 37 students who studied at the Music Education Department of Fine Arts Education Department of the Faculty of Education of Niğde Ömer Halisdemir University, and 32 students who studied at the Music Education Department of the Faculty of Fine Arts of Kırıkkale University. Since there are grade-level differences in research groups, each group has been evaluated with separate works and separate evaluation criteria.

Data collection tools and data analysis

For the sake of obtaining research data, descriptive data collection tools such as literature and archive review, qualitative tools for interviews, and quantitative data collection tools were used for face-to-face training and the documents of the midterm exam and final notes received in distance education.

Written sources such as articles, theses, papers, manuscript notes that can be directly or indirectly related and accessible to the problem statement of the research and the sub-problems formed on the basis of this problem statement were scanned.

In the spring semester of the 2019-2020 academic year, piano lessons were conducted through distance education (asynchronous). Giresun University used the GRÜ-UZEM system established in 2013 within the scope of education programs and activities, and Kırıkkale University used the KUZEM system established in 2009. Niğde Ömer Halisdemir University, which does not have its own infrastructure, has employed the MERGEN system, which is the technical infrastructure system of Anadolu University. Due to the lack of capacity of the MERGEN system, the learning platform Google Classroom system and the social media platform YouTube were used by both academic staff and students to support the MERGEN system for the application lessons in particular.

Three different faculty members from three universities carried out asynchronous lessons with the students selected as participants. Video recordings were requested from the assignments given at the end of each course and these recordings were evaluated with 3 observation forms developed by Yücetoker (2014). Content validities of this observation form are as follows; since the content validity index of the "work deciphering form" is 0.61 (criterion validity 0.54), the content validity index of the "technical form of the work" is 0.76 (criterion validity is 0.54), and the content validity index of "the acceleration and musicality form of the work" is 0.77 (criterion validity 0.54), these measuring tools were considered valid for practice. Limits for the interpretation of data from video recordings have been determined as 1.00 - 1.79 for "None" option, 1.80 - 2.59 for "Very Little" option, 2.60 - 3.39 for "Partial" option, 3.40 - 4.19 for the "Substantial" option and 4.20 - 5.00 for the "Completely" option (Yücetoker, 2014: 76).

Student midterm exam and final grades were obtained from the student information systems of Giresun University, Niğde Ömer Halisemir University and Kırıkkale University in order to determine the difference between the success grades of the students in the face-to-face education in the fall semester of 2019-2020 and the distance education results in the 2019-2020 spring semester. So as to determine whether there is a significant difference between the distance education process and the face-to-face education process, a paired-samples t-test was conducted. "Paired-samples t-test is a parametric technique used to test the significance of the difference between two arithmetic means when each subpore shows normal distribution characteristic (N1> 30; N2> 30)." (Yıldırım and Şimşek, 2006: 165).

FINDINGS AND INTERPRETATION

For each sub-problem, first of all, information about how piano education is done in the asynchronous distance education process is presented and then its findings are included.

Findings regarding success situations of the students at the sight-reading stage

The instructors have determined a repertoire, taking into account the cognitive and psychomotor skills of each student. During the semester, studies and works belonging to different periods were selected, videos were taken by the teacher on how to sight-read the works and studies and uploaded to the relevant system. By watching the recorded videos, students were asked to perform the behaviors specified in the “deciphering form of the work” section at the sight-reading stage of the works.

When Table 1 is examined, it is observed that the students paid "very little" (<2.30) attention to the criteria regarding finger numbers, staccato playing, and rest signs during the sight-reading of the works; and that they paid “substantial” (> 3.00) attention to the criteria of

Table 2. Means of the success situations of the students in the technical study stage.

Technical study	n	x̄	Std. deviation
Silent transition	103	1.82	0.759
Arpeggios	103	1.85	0.752
Playing two parties in one hand	103	1.97	0.796
Ornamentations	103	1.99	0.785
Chords	103	2.13	1.105
Connected double voices	103	2.26	1.102
Portato	103	2.44	1.304
Scales	103	2.45	1.100
Staccato	103	2.51	1.342
Two-hand coordination	103	3.02	1.243
Legato	103	3.49	1.259

starting position, correct rhythm and correct note. They paid “partial” (> 2.60) attention to the constant tempo, the number of measures, equipment signs, and legato playing criteria.

Findings regarding the success situations of the students in the technical study stage of the work

When the sight-reading stage of the works was over, the instructors moved to the technical study part. Technical studies were described separately for the works and studies of each period. Portato, staccato and legato playing techniques, which are important for the interpretation of the works, were primarily described and applied. Beside this, sequence plays, arpeggio teaching, chord playing, double voice binding, ornamentation teaching, silent transition technique, the ability to play multiple sound parties and two-hand coordination techniques were also described. The students have been asked to perform the behaviors specified in the “technical study form” section during the technical study stage of the works by watching the recorded videos.

When Table 2 is examined, it is observed that students paid "very little" (<1.98) attention to the criteria of silent pass, arpeggio and playing two parties in one hand during the technical playing stage; and paid “substantial” (> 2.50) attention to the criteria of legato, two-hand coordination and playing staccato. They paid “partial” (> 2.60) attention to the criteria for playing chords, connected double sounds, portato and scale.

Findings related to success situations of the students in the stage of achieving acceleration and musicality to the works

When the sight-reading process and the technical work stages of the works were completed, the part of rapid vocalization of and gaining musicality to the works has been passed. The acceleration and musicality studies have been explained and applied by the instructors and the videos have been shot and uploaded to the relevant system page for the participants to watch. The acceleration and musicality studies have been explained separately for each period's works and etudes. The ability to apply nuances for works, warnings of not having incorrect notes in speed, metronome studies for the importance of rhythm control while accelerating, synchronous control in speed, interpretation of musical phrases, theme announcement studies in polyphonic works, mastery of touch in speed and interpretation of music periods have been explained and exemplified. The students have been asked to perform behaviors stated in the "acceleration and musicality behavior form" section in the stage of bringing acceleration and musicality to the works.

When Table 3 is analyzed, it is observed that students paid "very little" (<1.60) attention to the criteria of nuance, synchronization, and mastery of touch in the process of giving acceleration and musicality to the works; and that they paid “substantial” (> 2.50) attention for the criteria of interpreting classical works, interpretation sentences and playing correct notes. They paid “partial” (> 2.60) attention to the criteria for announcing the themes, rhythm control, and interpreting baroque works.

Findings regarding the differences between students' achievement in face-to-face education and distance education

In Table 4, two different findings have been found. A significant difference has been found between the midterm grades that students received in the face-to-face education process and the midterm grades that they received in the distance education process (p= 0.001). It may be said that the midterm grades they received as a result of face-to-face education and the midterm grades they received as a result of distance education are

Table 3. The means of the success situations of the students in the stage of achieving acceleration and musicality to the works.

Acceleration and Musicality	n	x̄	Std. deviation
Nuances	103	1.42	0.712
Synchronization	103	1.52	0.706
Touch control	103	1.56	1.112
Announcing themes	103	2.13	0.942
Rhythm control	103	2.43	1.025
Baroque work interpretation	103	2.45	0.889
Correct note playing	103	2.55	1.262
Sentence interpretation	103	2.86	0.839
Classical work interpretation	103	3.01	1.165

Table 4. Comparison of face-to-face education and distance education grades.

Variable		n	Mean	Lower	Upper	t	p
Face-to-face education Distance education	Mid-term	103	15.019	12.741	17.297	13.077	**0.001**
Face-to-face education Distance education	Final	103	16.087	13.369	18.805	11.740	**0.001**

notably different. In the same way, a significant difference has been found between the final grades that students received in the face-to-face training process and the final grades that they received in the distance education process. (p= 0.001). In the present case, it may be said that the final grades they received in face-to-face education and the final grades they received as a result of distance education are remarkably different. In order to see at what level and where these differences originate, it is necessary to look at the means of the exams. The mean of the midterm exam in the face-to-face education process of the students is 57.99, while the mean of the midterm exam in the distance education process is 42.97. In the same way, the mean of the final exam in the face-to-face training process of the students was determined as 62.56, while the mean of the final exam is 46.47 in the distance education process.

CONCLUSIONS AND RECOMMENDATIONS

In the study, it has been concluded that the average success rate of the students in the work sight-reading stage was low in the asynchronous piano lessons. During the distance education process, it was found that students paid attention to the starting position, correct note and correct rhythm criteria; they did not pay attention to the criteria for finger numbers, staccato and rest signs. The fact that they did not pay attention to the finger numbers, staccato, and rest signs demonstrates that they did not look carefully at the note and therefore did not see the notation signs in the note. It can be said that the logic established by the students when sight-reading the work is only about playing “the correct note and the right rhythm” at the first stage, and as a consequence, they did not pay regard to the “visual” signs. Thusly, the fact that they largely fulfill the criteria for playing notes and scales correctly supports this idea. It can be said that this situation is caused by the student's conscious work. On the grounds of the moral power he/she receives from his/her teacher, who is next to him in face-to-face training, or the authority he/she feels in a positive sense, the student becomes more motivated in the lesson and gives his attention to the work he/she is doing. On the other hand, since there is no "power" controlling in the home environment and even in asynchronous piano lessons, students become lonely and gradually their attention levels decrease. The student, who does not feel under control at all times, develops a logic in line with his own logic and emotions and narrows his perspective. This can also cause students to develop a poor attitude towards piano lessons or develop a reluctant attitude towards piano learning in distance education. Regardless of which of these thoughts are correct, it does not change the fact that asynchronous courses do not develop students' sight-reading skills and cannot be a successful process. On the grounds of this, in extraordinary cases such as the pandemic we are experiencing today, it is recommended that distance education courses not be asynchronous,

and live courses should be carried out through distance education in order to get quick feedback on mistakes that students may make during the deciphering stage.

In the study, it has been concluded that the average success rate of students in the technical playing of the works in asynchronous piano lessons was low. During the distance education process, it was determined that students pay attention to legato, two-hand coordination, and staccato criteria, and they did not pay attention to the silent transition, arpeggio, and playing two parties in one hand criteria. In line with the feedback about sight-reading errors, it is seen that the staccato playing and legato criteria are paid attention to during the technical playing stage. On the other hand, despite the feedback made based on the "finger number" criterion, which they did not pay attention to during the sight-reading stage, the "silent pass" criterion was not considered in the technical playing stage. However, it was determined that the students experienced difficulties especially in the ornamentation technique, silent passages, and playing two sound partitions in one hand found in baroque works. In order to investigate this situation, feedback was asked for the students about why they could not. Based on the feedback, it was concluded that the students understood mordant, grupetto and trills from the videos they watched, but they experienced rhythmic problems in combining them with their left hand, since they vocalized their works on the organ, they could not do the silent transition due to the lightness of the touch, and could not see and understand the two sound parties in a single musical staff. The importance of technical study in piano education is indisputable and these technical studies should be done on the piano. Yet, piano lessons in distance education have forced students to perform technical work on organs with no touch quality, both because of their financial inadequacies and because they are unprepared for distance education due to the pandemic process. That being the case, in extraordinary situations such as the pandemic we are experiencing today, it is recommended that universities or higher institutions provide financial aid to music students for distance education and that music houses rent electronic pianos at low cost and develop an embezzlement system.

In the study, it has been concluded that students' average success rates were low at the stage of gaining speed and musicality to the works in asynchronous piano lessons. During the distance learning process, it was determined that students paid attention to interpreting classical works, interpreting sentences and playing the correct note, and that they did not pay attention to the criteria of nuance, synchronization, touch control. The shortcomings encountered in the basic techniques (legato, staccato) during the sight-reading and technical playing stage show themselves in a positive way in the classical period works. But the lack of attention to arpeggio playing at the technical stage leads to mistakes in the synchronization stage. As can be seen, each stage in instrument training is intertwined and complements each other. It was found that when students accelerated the works, they began to make mistakes in the notes of the works they had previously been sight-reading correctly, lost rhythm controls while gaining speed, and made two-hand synchronizing errors. Given the factors that can lead to these situations, unconscious speed studies can be interpreted more precisely as their sudden orientation to real speed without playing the work at a medium speed. In performing Baroque works, there are also errors in the inability to hear the same themes in another sound part, the inability to interpret musical phrases, and the loss of touch control. In particular, it has been found that nuance states are very poor. But this is a situation that should not only be thought as a student failure. Playing different works belonging to periods with nuances is difficult even in face-to-face education, while distance education is doubly difficult. Because students shoot through devices or phones that are inexpensive and have poor sound quality. Furthermore, students are very unlikely to be able to nuance under the influence of light-touch organs. Therefore, in order for the piano or instrument education to be of high quality and suitable for its purpose in the distance education process, it is recommended that video calling programs be improved in terms of synchronization, that high-quality audio and video recording devices be delivered to students, that internet infrastructure be developed throughout the country, and that computers that could strengthen the distance education infrastructure be provided to both academic staff and students.

In the study, it has been concluded that there were negative differences between the success grades that students received as a result of face-to-face training and the success grades that they received as a result of distance education. In face-to-face education, students' average midterm and final grades were normal, while in distance education, students' average midterm and final grades were low. The reasons leading to this condition are quite many. When considered on the student basis, many reasons can be listed such as the lack of working time of the students, the limitation of working opportunities, their low motivation towards the lessons they take remotely, the psychological tension they experience while filming themselves, the perspective of their parents who live in the same house, and so on. Considering other problems, factors such as the inability to have a piano in their home, the inability to have enough tools to record their videos, problems with the distance education system, the inability to communicate live with their teachers, the inability to do their homework on time, not attending lessons every week due to lack of attendance problem and not working on time can be listed. Consequently, in order for students' success to increase, it is recommended that universities and the Council of Higher Education impose an attendance

requirement for the live lessons in distance education, just as in face-to-face education.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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The effect of corona virus related anxiety of students at faculty of sports science on their physical activity levels

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This study aimed to examine the effect of Covid-19 anxiety on physical activity levels of the Faculty of Sports Sciences students. The information was obtained from 233 students of the Faculty of Sport Sciences. As a result of the reliability analysis of the scales, the Cronbach's Alpha value of the coronavirus anxiety scale in athletes was found to be 93; Cronbach's Alpha value of the cognitive behavioral physical activity scale was found to be 83. Structural equation model (path) analysis was applied so as to determine the effect of coronavirus anxiety on the athletes who participate in physical activity, and as a consequence of the analysis, it has been recorded that Covid-19 had a statistically noteworthy and negative effect on physical activity (β=0.353, p<0.05). 1 unit increase in Covid -19 anxiety causes 0.353 decrease in physical activity participation. It has been concluded that it explains 12.5% of the change in physical activity participation.

Key words: Corona virus, anxiety, physical activity.

INTRODUCTION

A disease seen in a number of people in a certain place and in a given time period is called "epidemic", and if this disease should spread to other continents and is observed between continents, it is called "pandemics". There have been many examples throughout the history that infectious diseases have turned into epidemics that affect the public health and lead fear and anxiety to be common in the society (Afacan and Zeynep, 2020). In today's world, the latest example of the pandemic is the Covid-19 virus, which is the mutated version of the Sars-CoV-2 virus. The Covid-19 infection appeared in Wuhan city of China with a population of 11 million in December of 2019 and it has severely affected the whole world. From this date onward, it has been declared as a pandemic by the World Health Organization (WHO) as of March 11 (Tural, 2020). Many countries all around the world, mainly Italy and Spain, have affected by the pandemic. The Covid-19 virus, which spreads very fast while in contact, has caused people to put physical distance and led governments to take some measures. The biggest one of these measures has been to quarantine people for the sake of public health. It has been observed that physical inactivity occurred in the community during the lockdowns leading people to spend

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time at home. Quarantine is a process that both leads emotional changes and inactivity by causing person to stay away from his routine (Eskici, 2020).

In contrast, WHO recommends physical activity should be done for at least 1 h per day. It is known that physical activities prevent cardiovascular diseases and weight gain by improving the skeletal muscle system and increasing the ability of humans to be active. With precautions taken, the change in the social environment of people who protect themselves from germs outside affects their living conditions (Hidalgo et al., 2020). Studies show that in this quarantine period, university students' mental health were really affected (Prilutskaya and Grjibovski, 2020). Due to the uncertain intervals of the lockdown experienced, it has been thought that anxiety and mental problems in university students resulted in many situations and also reduced the level of their physical activity. Therefore, the purpose of this study is to examine the effect of Covid-19 anxiety on the physical activity levels of faculty of sports sciences students.

METHODOLOGY

Research model

The study conducted according to the general scanning model consists of the students of the Faculty of Sport Sciences and the School of Physical Education and Sports in the Southeastern Anatolian region. Scanning model is a research approach which aims to define a given situation as it is (Karasar, 2015).

Research group

The research group consists of a total of 233 participants, 109 of whom are female and 124 male, who study at Siirt University School of Physical Education Sports, Şırnak University School of Physical Education and Sports, Gaziantep University Faculty of Sport Sciences in the 2020-2021 academic year. The data have been delivered to the participants by means of Google forms and their participation in this research was voluntarily. A total of 240 people were reached and 7 incomplete or incorrect forms were not evaluated. Thus, the number of forms to be included in the analysis is 233.

Data gathering tool

In the second part of the personal information form developed by the researcher, the Athletes' Anxiety Scale for the New Type of Coronavirus (Covid-19) was used, and the Cognitive Behavioral Physical Activity Scale (CBPAS) was utilized in the third part.

Cognitive behavioral physical activity scale

Athletes' anxiety scale for the new type of coronavirus (Covid-19) (NTCAA):

The scale with 16 articles, which Demir et al. (2020) tested for validity and reliability, consists of 16 articles and 2 dimensions. It consists of Individual Anxiety Scale (IAS) with 11 items and sub-dimensions of Socialization Anxiety (SA) with 5 articles. The lowest score to be obtained in the evaluations that will be made on the total score of NTCAA is 16 and the highest score is 80. The scale with 16 articles is a five-point Likert type. All expressions in the scale is scored as 1 “totally disagree” and 5 totally agree”. Since only the 2nd article in the scale includes negative expressions, it ought to be reverse coded.

Data analysis

The obtained data were statistically analyzed by using AMOS 21.0 SPSS 25.0 package programs. Structural equation model (path) analysis was applied with the aim of determining the effects of coronavirus anxiety on athletes' participation in physical activity. The scale’s reliability was determined by Cronbach's Alpha parameter. It has been found that Cronbach's Alpha value of the coronavirus anxiety scale in athletes was 93 and Cronbach's Alpha value of the cognitive behavioral physical activity scale was 83.

RESULTS AND DISCUSSION

The study findings are described using tables and figures. Table 1 contains demographic information. Table 2 shows Model results of the first-order multifactor confirmatory factor analysis of the cognitive behavioral physical activity scale. Table 3 demonstrates the model related with the multifactor confirmatory factor analysis of the coronavirus anxiety scale in athletes. Table 4 shows model results for the first level multifactorial confirmatory factor analysis of the coronavirus anxiety scale in athletes. Table 5 shows the goodness of fit results of the model for the first-order multifactorial confirmatory factor analysis of the scale. Table 6 shows results as to the research model. Figure 1 shows cognitive behavioral physical activity scale (CBPAS) and multifactor confirmatory factor analysis (CFA). Figure 2 shows path diagram of the proposed model for the effect of coronavirus anxiety on physical activity participation. This study has been conducted to examine the effect of coronavirus anxiety on physical activity levels of students who study at the Faculty of Sport Sciences.

Governments have taken some precautions to reduce the risk of transmission of the Covid-19 virus affecting the whole world both physically and mentally. The main precautions are social distance, mask and home isolation. With these preventive measures, the time that individuals spend in their own living spaces has increased. It is emphasized that low physical activity level will have effect physical and mental health in short periods (Öncen et al., 2020). According to WHO, the definition of health is not only protection from diseases, but also physical, mental and social well-being. As the time spent at home increases, some mental disorders and anxiety occur. A total of sport sciences faculty students (n = 233) between the ages of 18-22 male (n = 124) and female students (n = 109) voluntarily participated in this study. The number of the students who participated in the study in which Ceviz et al. (2020)

Table 1. Demographic information.

Demographic variable		f	%	Total
Age	18-19	46	19.7	233
	20-21	92	39.5	
	22 and over 22	95	40.8	
Sex	Female	109	46.8	
	Male	124	53.2	
Grade	1	107	45.9	
	2	23	9.8	
	3	40	17.2	
	4	63	27.0	
Department	Teaching	71	30.5	
	Coaching	85	36.5	
	Management	69	29.6	
	Recreation	8	3.4	

The majority of the participants are aged 22 and over with a rate of 40.8% (n=95). As for the highest variable in their own category, the students are male with a rate of 53.2% in gender variable (n=124). The first graders are with a rate of 45.9% in grade variable (n=107) and the students of the coaching department are with a rate of 36.5%.

Table 2. Model results of the first-order multifactor confirmatory factor analysis of the cognitive behavioral physical activity scale.

Factor	Terms	Parameter estimate (factor loading)	Standard error	t-Value	p-Value
Expected Results	A1	0.881	-	-	-
	A2	0.878	0.059	16.547	***
	A9	0.697	0.059	12.033	***
	A13	0.691	0.063	11.891	***
	A14	0.459	0.078	7.084	***
Self-regulation	A3	0.656	-	-	-
	A4	0.652	0.105	8.139	***
	A5	0.789	0.110	9.250	***
	A6	0.660	0.122	8.222	***
	A8	0.411	0.127	5.462	***
Individual Barriers	A7	0.757	-	-	-
	A10	0.683	0.090	8.997	***
	A11	0.580	0.090	7.784	***
	A12	0.625	0.090	8.336	***
	A15	0.450	0.090	8.997	***

When the correlations between variables are examined, it is seen that the factor loads of the items are above 0.40 and all correlations are significant (*p<0.05).

analyzed the variables affecting the anxiety levels of university students during the Covid-19 period was 262. Moreover, the number of male participants in the same study is 182 and female participants is 26. It shows similarities with other studies (Göksu and Kumcağız, 2020; Altun, 2020; Rogowska et al., 2020) in terms of the

Table 3. The model related with the multifactor confirmatory factor analysis of the coronavirus anxiety scale in athletes.

Variables	Structural equation model value	Recommended value	Goodness of fit	Resources
χ2/df	2.700	≤ 5	0≤ χ2≤ 3	Meydan and Şeşen (2015: 37)
RMSEA	0.086	≤ 0.08	0≤ RMSEA≤ 0.05	Simon et al. (2010: 234-243)
GFI	0.876	≥0.80	≥0.90	Simon et al. (2010: 234-243)
AGFI	0.826	≥0.80	0.95≤ AGFI≤ 1.00	Shevlina et al. (2000: 181-185)
CFI	0.893	≥0.80	0.90≤ CFI≤ 1.00	Dehon et al. (2005: 799-810)
SRMR	0.074	≤ 0.10	0≤SRMR≤0.05	Schermelleh-Engel (2003: 23-74)

Table 4. Model results for the first level multifactorial confirmatory factor analysis of the coronavirus anxiety scale in athletes.

Factor	Terms	Parameter stimate (factor loading)	Standart error	t-Value	p-Value
Individual anxiety	K1	0.505	-	-	-
	K2	0.555	0.171	6.496	***
	K3	0.717	0.185	7.512	***
	K4	0.551	0.138	6.470	***
	K5	0.738	0.155	7.618	***
	K6	0.775	0.167	7.785	***
	K7	0.814	0.188	7.956	***
	K8	0.711	0.175	7.479	***
	K9	0.818	0.179	7.978	***
	K10	0.797	0.167	7.896	***
	K11	0.844	0.183	8.084	***
Social anxiety	K12	0.786	-	-	-
	K13	0.845	0.075	14.099	***
	K14	0.802	0.073	13.216	***
	K15	0.862	0.073	14.453	***
	K16	0.635	0.072	9.971	***

When the correlations between variables are examined, it is seen that the factor loads of the items are above 0.40 and all correlations are significant (*p<0.05).

Table 5. Goodness of fit results of the model for the first-order multifactorial confirmatory factor analysis of the scale.

Variables	Structural equation model value	Recommended value	Goodness of fit	Resources
χ2/df	2.938	≤ 5	0≤ χ2≤ 3	Meydan and Şeşen (2015: 37)
RMSEA	0.091	≤ 0.08	0≤ RMSEA≤0.05	Simon et al. (2010: 234-243)
GFI	0.856	≥0.80	≥0.90	Simon et al. (2010: 234-243)
AGFI	0.806	≥0.80	0.95≤ AGFI≤ 1.00	Shevlina et al. (2000: 181-185)
CFI	0.919	≥0.80	0.90≤ CFI≤ 1.00	Dehon et al. (2005: 799-810)
SRMR	0.056	≤ 0.10	0≤SRMR≤0.05	Schermelleh-Engel (2003: 23-74)

According to the Confirmatory Factor analysis, it is seen that the structural equation model (Structural Equation Modeling Results) of the scale is significant at the p = 0.000 level. CFA was performed on 12 items that make up the scale and it was determined that it was related to 16 items and 2-dimensional scale structure (Table 4). It is pointed in the table that the values accepted for the fit index in the calculations of fit index are met.

age and gender range of the participants. When the correlations between variables are examined in this study, it is seen that the factor loads of the items are above 0.40 and all correlations are significant in terms of

Table 6. Results as to the research model.

Effect	Estimate (β)	Standart error	t-value	p-value	Result
Health →YK	-0.353	0.044	-3.763	***	Significant
Compliance index:					
CMİN/DF	2.163				
GFI	0.800				
CFI	0.874				
RMSEA	0.071				

Covid 19 appears to have a statistically significant and negative impact on physical activity (β=0.353, *p<0.05). 1-unit increase in Covid-19 anxiety leads a 0.353 decrease in participation in physical activity. This explains the change with a rate of 12.5% on participation in physical activity (R^2=0.125).

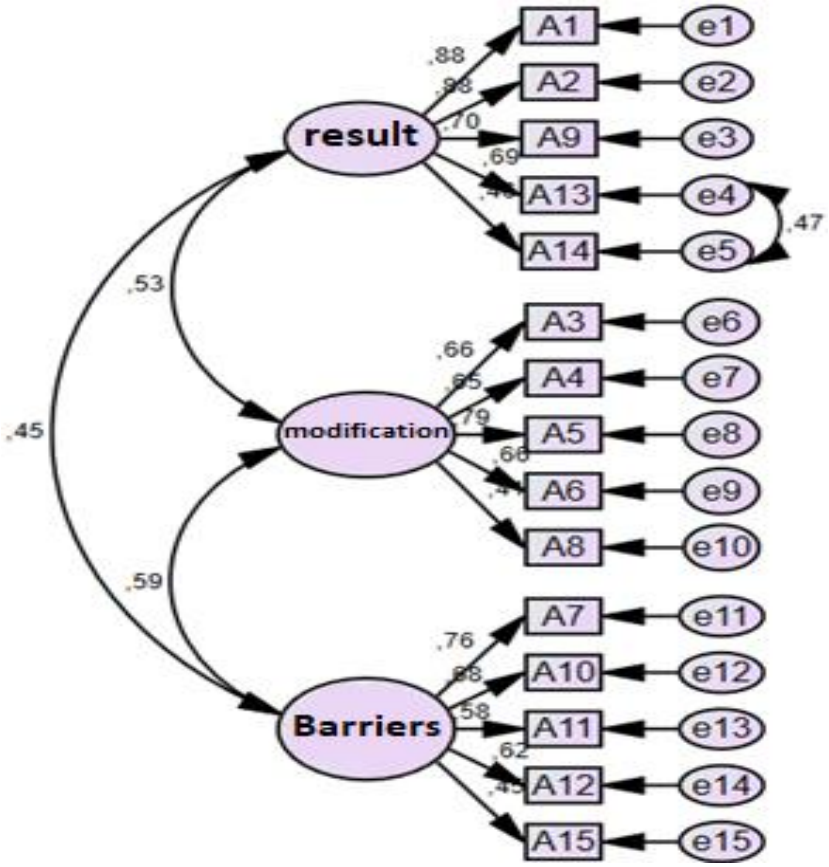

Figure 1. Cognitive behavioral physical activity scale (CBPAS) and multifactor confirmatory factor analysis (CFA).

social and individual anxiety (p<0.05). In a study conducted in the People's Republic of China, where Covid-19 first appeared, Cao et al. (2020) has revealed that university students' anxiety levels caused by Covid-19 increased and they have found that anxiety level of the students with a rate of 24.1% who participated in the study increased. Since anxiety causes fear in individuals and hence in the society, it is inevitable for them to develop protective attitudes. Accordingly, Wang et al. (2020) has revealed that taking precautions such as masks and distance reduces anxiety. In the study conducted in the USA, an increase in anxiety was observed in the sample group during the swine flu epidemic (Wheaton et al., 2012). On account of the uncertainty of academic calendar of the universities, falling behind from the practical lessons that could have

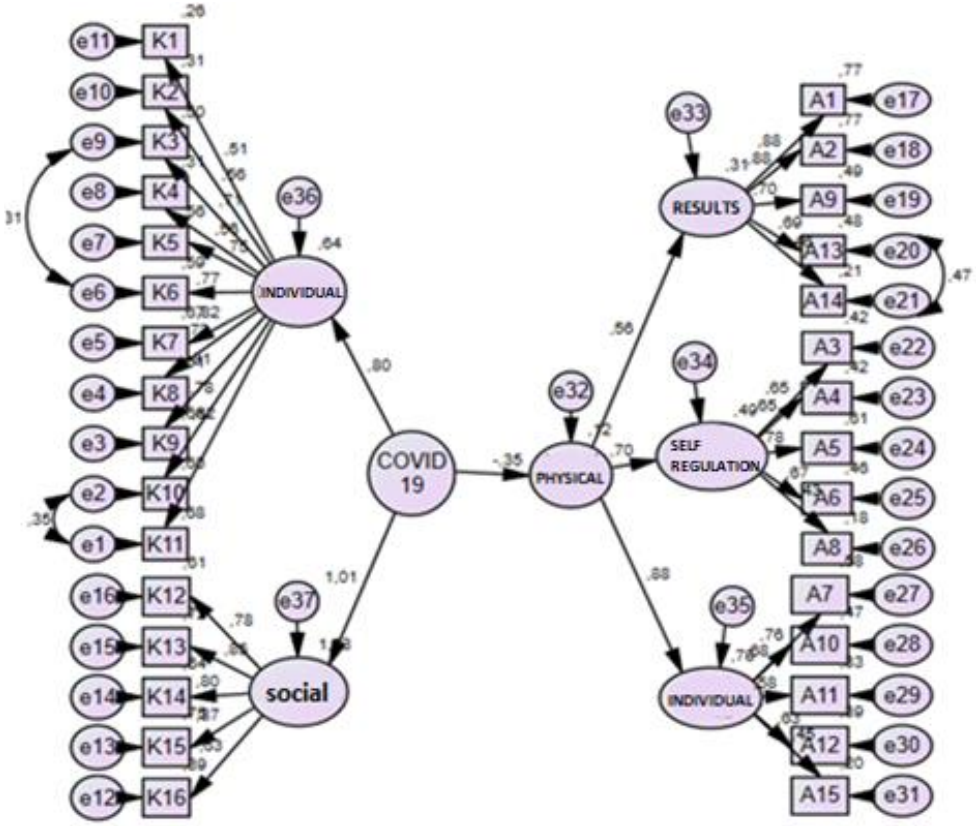

Figure 2. Path diagram of the proposed Model for the effect of coronavirus anxiety on physical activity participation.

done face to face both in our country and all over the world, students are the most damaged ones among the groups in terms of mental health. With the help of this information, Alyami et al. (2020) found that anxiety was seen at a rate of 19% during the Covid-19 pandemic period. In a study conducted with 400 university students in Saudi Arabia, it has been observed that 35% of the students have normal and high levels of anxiety. Having regard to related literature, it has been found in other similar studies (Inam, 2007) that the anxiety levels of university students increased during the Covid-19 period. It is thought that not solely leaving their schools academically but also reduced frequency of physical activity as a result of some precautions leads mental and physical discomfort in students. According to current studies, it is seen that daily physical activity decreases the risk of depression or anxiety (Dunn et al., 2005; Penedo and Dahn, 2005). Depending on these studies, when the anxiety level increases, the frequency of physical activity decreases. When the results of this study are concerned, a 1-unit increase in Covid -19 anxiety causes a 0.353 decrease in physical activity participation. The change in physical activity participation is explained with a rate of 12.5%. There are studies supporting the findings in the related literature.

Biddle and Mutrie (2001) have found that physical activity and exercise positively affect anxiety. Physical activity intensity is thought to have different mental effects. It occurs especially when the young people are mentally tired. In a study in which physical activity and mental health are examined in university students, it has been seen that physical activity has a positive effect on students mentally and in the same study, it has been found that students having more physical activity have a healthier mental structure (Tyson et al., 2010). With the sports halls and recreation areas closed as a result of the Covid-19 pandemic, the range of places at which university students can exercise is also restricted and the time period spent in the state of inactivity has increased. Spending leisure time in a wrong way and physical inactivity increase anxiety in university students. Lee and Kim (2018) have revealed that an average of 7.96 h of sitting per day increases the anxiety and stress levels of university students. University students should do physical exercise at home or places that is suitable for the protection rules against Covid-19 by remembering that health is not all about protecting ourselves from microbes in this lockdown period. The exercises which can be followed by using internet connection and some mobiles apps can increase the intensity or frequency of

physical activities and can be used in future researches.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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Dyslexia in higher education

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The number of students with learning disabilities in post-secondary institutions has grown substantially, and those with dyslexia compile the largest subgroup. This study explores the utility conceptualization of dyslexia by analyzing the subjective experiences of 30 students from two 2-year institutions. Interviews confirmed that these students exhibited dyslexic traits, and the study findings indicated that they used a variety of approaches to succeed academically despite a perceived disability. None of the strategies used were related to repairing a phonological deficit. Instead, these students relied on the development of compensatory skills, e.g., internal strengths, to improve experiences and maximize learning performances.

Key words: Adult dyslexia, dyslexia, compensated dyslexic, dyslexic, learning disabilities.

INTRODUCTION

Current estimates indicate that 35 million Americans have a learning disability (LD), and dyslexia is by far the most diagnosed among all LDs (Zablotsky et al., 2019). However, this number is somewhat difficult to pin down, as people are often disinclined to admit they have problems with learning. The purpose of this research is to explore the utility of this medical conception of a learning difficulty as a deficit and the degree to which it may hinder the ability of students with an LD to succeed academically. Given that higher education is considered necessary for economic competitiveness, it seems reasonable to ask the question, 'how does research into LD deficits help students succeed academically?' A literature review revealed that research into LD deficits does address the key concerns for those who have dyslexia. In fact, such research may harm some students' abilities to succeed in a higher educational setting. A closer look at dyslexia in higher education, the focus of this study, supports efficient conveyance of information to those who contend with an LD. As is the case with most communication, the transmitted message is the burden of the deliverer; the message bearer should make sure the receiver hears the intended message.

Subsequently, the argument is made that students taking higher education courses who possess dyslexic traits succeed when they use internal strengths rather than attempting to correct their phonological deficits. Furthermore, qualitative findings validate that a "dyslexic" or "learning-disabled" label is more likely to cause harm rather than improve academic outcomes. The following sections discuss the theoretical perspectives regarding LDs, followed by a specific discussion of dyslexia and its

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associated deficits. The discussion then turns to higher education and students who have an LD.

Theoretical perspectives of disability

There are three major perspectives on LDs that often guide the kinds of questions one may ask about a given disorder: the medical model, the minority group paradigm, and social constructivism (Brown and Broido, 2015). The medical model is perhaps the most used and is the foundation of how LDs, specific learning disabilities (SLDs), and dyslexia are defined. Thus, an LD is characterized by an abnormality that can and should be corrected through some type of intervention or cure (Brown and Broido, 2015; Lambert and Dryer, 2018; Moriña, 2017).

Since the advent of neuroimaging techniques, there has been a serious publication bias in favor of the “science” of psychological disorders. Subsequently, some researchers have moved away from the subjective experiences of those with these “disorders” and into a paradigm where the asymptomatic attempt is to find an underlying through cognitive neuroscience (Mayer, 2016). The ability to map the brain has led some researchers to focus exclusively on the underlying neurological correlates of LDs, specifically dyslexia. The current understanding of the brain and how its various mechanisms translate into human behavior is at its infancy, as is made evident by the brain mechanisms mentioned in the literature regarding dyslexia (Kearns et al., 2018; D’Mello and Gabrieli, 2018). Yeom et al. (2020) surmise the significance of the brain by stating “brain mechanisms have important academic and practical implications” (p. 1).

While all the information we can gain about dyslexia is welcomed, a medical perspective may not always be ideal, or even useful. For instance, how useful is a biological explanation for a condition that cannot be treated, such as in improving the academic performance of those who grapple with dyslexia? Bowers (2016) argues that it is not useful, and that neuroscience in its current form offers little insight in terms of teaching those who have dyslexia. It is easier to measure the capacities of students based on behavioral measures rather than brain images. In addition, and perhaps most importantly, effective instructional techniques often focus on *developing compensatory skills* rather than correcting deficits. Since the basis of neuroscientific inquiry rests on the comparison of “*normal*” brains to those that are “defective,” it can never assist in the development of an individual’s other internal capacities. When a person has a physical disability, such a permanent paralysis, rehabilitation seldom focuses on fixing the deficit, but rather on developing strategies to work around any shortcomings. Since there is no consensus about the biological basis of dyslexia (or any other LD), nor any sort of biological treatment, it makes little sense to conceptualize that an intervention will correct the deficit. Thus, the focus on the medical model of learning disorders leads researchers to ask questions that are not useful in improving the livelihoods of individuals with dyslexia. However, the other two models view dyslexia less as a deficit and more as a difference.

The minority group (social group) paradigm argues that a disability should be characterized along the spectrum of normal human variation, and that those who have an LD are just one variant among many (Kong and Orosco, 2016). As a protected class in relation to civil rights—among ethical/racial, religious, or gender lines—minority group members receive protections that enable them to thrive within the general population. The minority group paradigm and constructivism similarly conceptualize those who have an LD or dyslexia as members of an oppressed group who deserve support. The social constructivist perspective argues that the conception of a "disability" is itself a social construct that can only be interpreted in opposition to a given social standard (Caliskan et al., 2017; Trent et al., 1998). The social construction paradigm accentuates collaboration between the facilitator and the learner, which aids the latter in appropriative interpretive experiences prompted by extrinsic stimuli (Vygotsky, 1978). Today, Vygotsky’s (1978) prophetic view of multicultural education, the infusion of diverse cultural beliefs and practices in the learning process, is highly significant.

Today, Vygotsky (1978)’s prophetic view of *multicultural education,* the infusion of diverse cultural beliefs and practices in the learning process is highly significant.

The minority group and constructivism models are useful in that they direct attention away from trying to "fix" what is supposedly "broken" in those who have an LD. The focus is no longer on merely finding strategies to improve learning outcomes, but on finding tools that enable students’ strengths to enhance learning outcomes. The discussion on dyslexia now turns to post-secondary education in the US, which is followed by a discussion of students with LDs in higher education.

Post-secondary education in the US

Higher education has long been considered one of the primary mechanisms by which disadvantaged populations can successfully compete economically in society. Its status as an arbiter of social justice is difficult to surpass. Some people view accessible post-secondary education as one of the only ways in which communities can promote economic opportunities for those who would not have them through other means. It is, therefore, disconcerting that large numbers of individuals who begin a post-secondary program never receive a degree.

According to the US Department of Education’s National Center for Education Statistics (USDE, 2017), only about 60% of the overall student population will receive a bachelor’s degree within six years of beginning

a four-year program. Broken down by race, these numbers are White, 63%; Hispanic, 53%; and Black, 40%. These rates are for enrollment in four-year institutions; however, completion rates vary significantly depending on the type of institution. When certificate programs and community colleges are included, the dropout rate increases to approximately 60% (USDE, 2017). These numbers reveal that, for reasons that are not completely clear, an exceptionally large number of individuals who begin college never finish. This is disturbing for at least two reasons. First, as mentioned before, higher education discontinuance severely harms people's ability to succeed economically. Second, post-secondary education benefits the economy as a whole; people with degrees are more likely to make technological advances or contribute directly to a robust economy for everyone (Alessandrini, 2018; Missingham, 2017).

While there are socioeconomic factors at play, the question remains as to why so many students who enroll in post-secondary education fail to receive a degree. Educators have been trying to answer this question for quite some time, and often further ask if ethnic and socioeconomic factors play a role. The statistics by race are mentioned above, but the attendance and completion gap between the lowest earners and highest earners is dramatic. Only 30% of individuals from the bottom income quartile are expected to enroll in college, compared to 80% in the top quartile, and those in the highest quartile are six times more likely to obtain a degree by age 25 (Goldrick-Rab et al., 2016). College preparedness seems to play a large role as well; students who are well-prepared before entering college are more likely to receive a degree, which likely contributes to the income disparity in achievement (Asghar et al., 2019).

Some scholars have argued that the rigid classroom structure in American education simply does not fit all people, particularly those with learning difficulties or from other countries (Waitoller and King Thorius, 2016). Further, some have argued that learning "disabilities" are rooted in social norms that favor certain types of learners over others (Waitoller and King Thorius, 2016). Recently, scholars have argued in support of culturally sustaining pedagogy (CSP) and a universal design for learning (UDL), concepts that will be explored in the next two sections (Waitoller and King Thorius, 2016).

Culturally sustaining pedagogy

The deficiencies among certain groups in the American educational system have existed since the beginning of mass education. Scholars have long attempted to develop different methods of teaching (pedagogies) that address the stark differences in ability and achievement across race, ethnicity, gender, and social class. In the 1960s, the dominant approach was what researchers called "deficit" pedagogies (Sharma, 2018). This perspective rested on the assumption that if students did not perform well, it was so because they had a deficit in one ability or another, and the goal of the pedagogy was to make corrections (Sharma, 2018).

The next era of the 1970s and 1980s brought "difference" pedagogies (Sharma, 2018). In comparison to "deficit" pedagogies, difference pedagogies simply viewed cultural variations in language and learning as equal but different. This same era brought with it resource pedagogies that viewed the knowledge obtained through experience of a different culture as a resource to improve learning in the classroom. Then, in 1995, Gloria Ladson-Billings published a landmark paper titled "Toward a Theory of Culturally Relevant Pedagogy," wherein she laid out the framework for an idea that continues to strongly influence educational circles and scholarship (Ladson-Billings, 1995; Sharma, 2018). The goal of CSP is: to perpetuate and foster—to sustain—linguistic, literate, and cultural pluralism as part of the democratic project of schooling. In the face of current policies and practices that have the explicit goal of creating a mono-cultural and monolingual society, research and practice need equally explicit resistances that embrace cultural pluralism and cultural equality (Paris, 2012, p. 93).

The research targets of these scholars are marginalized groups such as ethnic minorities, women, and people with low socioeconomic status (SES). Systemically, educational institutions tend to cater to the learning styles and preferences of certain groups, which leave some groups at a serious disadvantage. The specifics of this theory and its application are beyond the scope of this paper; however, the point is that education is moving toward a more inclusive model than past models that had excessively rigid classroom structures. Such structures that relied on verbal forms of knowledge transmission have not proven to be universally effective.

Universal design for learning

A parallel body of literature has recently emerged in educational circles, focusing on a UDL model. This concept was based on architectural practices of the 1990s, which sought to ensure that even those with physical disabilities could have access to public spaces (Waitoller and King Thorius, 2016). The ideas behind UDL have since been applied to education. The central tenant of UDL is that any curriculum that is not designed with natural human variation in learning in mind is disabling to students. This concept turns "deficit" approaches on their head and asks the opposite question: how can one design a program so that all learning styles are accommodated? The theory behind UDL explicitly acknowledges that some people simply learn differently than others. Only a small number of

students acquire all new knowledge easily; in contrast, many students struggle to master new subjects, and most students will need support services at one time or another (Griful-Freixenet et al., 2020; Keefer, 2017; Missingham, 2017; Richardson, 2015).

Waitoller and King Thorius (2016) make a strong argument that those with LDs should be counted among marginalized groups targeted by CSP. They argue, cogently, that "disability" can only be conceptualized in opposition to "normalcy." That is, if a person is not able to perform a function in the usual way, then they are said to be “disabled.” As discussed above, this has been the hallmark of educational pedagogies for decades and seeks to "correct" supposedly “incorrect” ways of doing (and in this case thinking). Waitoller and Thorius further argue that, for the most part, LDs should be considered part of natural human variation in learning, and that corrective efforts should focus on the delivery of the information, rather than on correcting a deficit in the learner.

Learning disabilities in post-secondary institutions

The number of students with LDs attending post-secondary institutions in the US is difficult to measure for several reasons. While physical disabilities are reported regularly, students with LDs (most of whom are dyslexic) often go unidentified. This is because in post-secondary education, students are required to self-disclose, and many have never been formally diagnosed, do not think they need to receive support, or fear being stigmatized (Griful-Freixenet et al., 2020; LDA, 2012; Lindsay et al., 2018; MacCullagh et al., 2016; NJCLD, 2011; Proctor et al., 2017; Sniatecki et al., 2018; Waterfield and Whelan, 2017). One large-scale analysis of 63,802 undergraduates at 11 four-year research universities showed that 5.96% self-reported an LD, and only about one-third of those reported receiving accommodations (McGregor et al., 2016). Of course, for the reasons mentioned above, this probably underestimates the actual number of students who are affected. Furthermore, it appears that many K−12 students who are diagnosed with an LD also belong to minority groups with even lower graduation completion rates (Chitiga, 2017).

According to some estimates, up to 15% of students enrolled in higher education have an LD (Bundock et al., 2019; Lipka and Hess, 2016; McMorris et al., 2019). Some studies show extraordinarily little difference in completion rates, but this may be the result of many students with disabilities self-selecting out of the endeavor before ever enrolling. Some research looks at completion for those who start a higher education program, while other researchers look at the raw number of degrees at a certain point after high school (Brown and Broido, 2015). In the last 20 years, post-secondary institutions have seen a massive increase in enrollment for students with LDs, all of whom are guaranteed accommodations by Title II of the *Americans with Disabilities Act* (ADA, 1990). Some enrollments have been as high as tenfold (CEC SmartBrief, 2011; Chan, 2016; Moriña, 2017; Stevens et al., 2018).

However, scarce information assimilated in professional trainings (Clouder et al., 2016) and shared among colleagues regarding students with dyslexia in higher education hinders these students’ academic and economic development. As Dr. Stephen Hawking, the world-renowned scientist, once said, “Disability need not be an obstacle to success. I have had motor neuron disease for practically all my adult life. Yet it has not prevented me from having a prominent career in astrophysics and a happy family life” (World Health Organization [WHO], 2011, p. ix). School dropouts are often the outcome of academic failure (Reisman and Severino, 2021), and the drop-out rate for students with LDs—most of whom are dyslexic—is estimated as high as 50% (Moriña, 2017). Reportedly, this percentage is not far from the dropout rate of the general population, making an even stronger argument that the dropout issue lies with the delivery of academic information, rather than with the students themselves. Moreover, the provision and receipt of adequate support available to identifiable students with dyslexic traits in higher education is also an opportunity to support all students, especially those who are not diagnosed.

Learning disabilities

A disability is defined as “any condition of the body or mind (impairment) that makes it more difficult for the person with the condition to do certain activities (activity limitations) and interact with the world around them (participation restrictions)” (Centers for Disease Control and Prevention, 2019, para. 1). Documented evidence of disabilities dates to the Middle Ages (Galer, 2014; Godden and Hsy, 2013). Oliver et al. (2012) discussed the modern conceptualization of disability as they distinguished the biomedical perspective from the social perspective. In the former, a disability is a problem that needs to be fixed, while in the latter, society acknowledges the limitations of people with disabilities. Sam Kirk is credited with coining the term “learning disabilities” in a Chicago meeting with parents and professionals held in 1963 (Kirk, 2009). Kirk (2009), in citing W. D. Kirk, defined an LD as “a psychological or neurological impediment to perceptual or communicative disorder” (p. 25). An earlier definition by Kirk and Elkins (1975) added reading deficits to the definition of an LD. While these were the first published definitions, many more have been published since. The Educator's Diagnostic Manual of Disabilities and Disorders defines an LD as a neurobiological disorder that includes specific difficulties in reasoning, reading, writing, listening,

speaking, or math (Pierangelo and Giuliani, 2007).

Additionally, the literature recognizes SLDs, which are defined by the US Department of Education (2012), as the imperfect ability to "listen, think, speak, read, write, spell, or do mathematical calculations" (Para. 1). WHO defines SLDs as “impairments in information processing resulting in difficulties in listening, reasoning, speaking, reading, writing, spelling, or doing mathematical calculations – for example, dyslexia” (WHO, 2011, p. 309). Perhaps one of the more complete definitions comes from the reauthorization of the Individuals with Disabilities Education Act (IDEA) in 2004, which states: The term “specific learning disability” means a disorder in 1 or more of the basic psychological processes involved in understanding or in using language, spoken, or written, which may manifest itself in the imperfect ability to listen, think, speak, read, spell, or do mathematical calculations. Such term includes such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. Such a term does not include a learning problem that is primarily the result of a visual, hearing, or motor disabilities; of mental retardation; of emotional disturbance; or environmental, cultural, or economic disadvantage (USDE, IDEA, 2004, §602.30, 2012).

Two major themes stand out in these definitions. First, the person has problems learning material that cannot be explained because of their sensory perception, second, the preceding definitions center on the measurement of some "deficit" that exists compared to "normal" learners. While this may be a reasonable way to conceptualize LDs in some contexts, with further exploration, it becomes clear that this is not the only way to think about LDs and SLDs, and that how they are conceptualized can have real-world consequences for individuals with LDs and SLDs. In the next section, dyslexia will be defined, followed by theoretical considerations surrounding how LDs are defined and diagnosed.

Dyslexia

Defining dyslexia is even more problematic. The recent update to the DSM-V no longer contains separate diagnostic criteria for dyslexia; it is now lumped with other SLDs and allows the person doing the diagnosis to make a specific recommendation (ADA, 2013). Further, as no two individuals exhibit identical symptoms, defining and identifying dyslexia has been the subject of extensive debate. While there are established indicators for children, the focus of this study is on adult dyslexia and, therefore, on the symptoms experienced in adulthood.

Many authors have described the characteristics of dyslexia. While there is some overlap, some of the definitions include characteristics that others do not. Proctor et al. (2017) list the following as identifying behaviors related to dyslexia: a tendency to exhibit intensity in reading and writing tasks, and an inadequate command of vocabulary skills and perhaps recall. However, individuals who exhibit symptoms of dyslexia can also be very competent in oral language, have good intuition and people skills, and generally be very apt at reading people. The Learning Disabilities Association of America (LDA, 2012) also lists what they consider to be the most prevalent characteristics of dyslexia; people may read well but not write well (or vice versa), may be able to learn information in one way but not another, may have a short attention span, be impulsive, or easily distracted, and may have difficulty following directions, especially directions with multiple steps. These definitions are not identical, but each allude to the various characteristics one may find in any given individual with dyslexia. However, the ambiguity of these definitions highlights the perceptual imprecision of the term as well as a judgment perspective.

Diagnoses

Despite the widespread prevalence of dyslexia diagnoses, there is disagreement regarding the actual nature of the condition. Some researchers argue (and have tried to demonstrate) that the root of dyslexia is in phonological processing (Saksida et al., 2016). Other research suggests that dyslexia is a combination of phonological processing and problems with executive functioning (which encompasses working memory, planning, inhibition, and set-shifting (Smith-Spark et al., 2017). Still, other researchers posit a deficit in implicit learning, such as the ability to detect patterns that are not made explicit, as in the early development of language skills (Kahta and Schiff, 2016). Others, such as Elliott and Grigorenko (2014) argue that because all types of reading disorders respond to the same types of interventions (that is, phonological interventions), it makes no sense to single out some students as having a disorder and others as only having a problem with reading. Their point is that if the interventions are the same, why diagnose someone with a neurocognitive "deficit?" As will be discussed later, it may not be useful to diagnose individuals as having a disorder, as it may not change the interventions used, but may instead serve to stigmatize and single out certain individuals in a higher educational setting.

Furthermore, some individuals cope with their dyslexic traits very well and, ironically, many even excel in diverse venues despite them (Deacon et al., 2012; Eide and Eide, 2011; Kemp et al., 2009; Swanson et al., 2014). Sometimes labeled as compensated or high-functioning dyslexics (Deacon et al., 2012, p. 121), such people of exceptionality cannot be normalized. They are distinct; a more precise label is “differentia.” *Differentia* distinguishes one entity from another, and attests to these remarkable individuals and how they counterbalance their dyslexic traits (Richardson, 2015). The mode of learning for such individuals is different, but they compensate to succeed.

These individuals are neither linear strategists nor conformists, yet they are highly methodological, creative, and known for thinking outside of the box.

The present study

The goal of this research is to explore the subjective experiences of post-secondary students with dyslexic traits. Two research questions were addressed: (1) What strategies do students with dyslexia use to cope with their various learning issues, and (2) How has the dyslexic label affected their post-secondary experiences? By exploring the experiences of college-aged students with dyslexia, one can begin to unravel what allows these students to succeed and why they may fail. The findings will provide insight into the proper conceptualization of dyslexia and its relation to learning for students with and without the *deficit***.** The study was designed to identify the degree to which LD strategies focus on developing compensatory skills rather than correcting deficits. Furthermore, exploring the impact of the label on students' experiences may provide some insight into its usefulness in terms of improving academic achievement and outcomes.

MATERİALS AND METHODS

This study used a qualitative critical-ethnographic research design to explore the lived experiences of college students with dyslexic traits.

Participants

The participants were 30 students from two 2-year institutions. The sample consisted of 17 women and 13 men, ranging in age from 19 to 47 years. The inclusion criteria used to select participants were as follows: (a) current enrollment in a post-secondary education program, and (b) a perceived LD (diagnosed or not). To determine if the students were possible participants and whether they had probable dyslexic traits, the researcher asked them three questions: (1) Do you tend to switch numbers and/or letters around when writing; (2) When you are talking, do you often have a difficult time trying to find the right word to say; and (3) Do you often change topics in the middle of a conversation? Students who responded "yes" to any two of the three questions were invited to participate in the study. While controversy exists over appropriate dyslexic assessment methods (Elliott and Grigorenko, 2014), this study's qualification questions were derived from the literature, which describes these constructs as dominant traits of dyslexia.

Instrumentation

The interview protocol for this study was semi-structured, which left room for modifications based on how participants responded. The interview protocol was designed to elicit four types of information from the students: (1) background, (2) academic experiences, (3) use of institutional resources, and (4) use of personal academic strategies and tools.

Interview questions

1. Describe your learning challenges associated with dyslexia and the impact on your college academic performance.
2. What strategies have you developed to help you with your college studies?
3. What types of academic support are available to you at your college?
4. What college supports or college services have you used to help you academically?
5. Tell me about your journey in college; how are you doing academically?

All interview questions and participants' responses were provided audibly.

Sampling

A nonrandom sample was gathered for this study so that participants could provide the desired information. No formula was used to determine sample size; however, according to standards established by Hancock et al. (2016), a sample size between 12 and 60 is sufficient to reach data saturation in qualitative studies. Subsequently, 30 participants were included in the study.

Interview process and data collection

The actual number of interviews conducted was 31; however, one female student was excluded because she had already obtained a bachelor's degree at the time of the interview and was simply taking a refresher course. The researcher used previous background in teaching students with LDs at both secondary and post-secondary institutions to develop the proprietary interview protocol. The protocol consisted of five questions. Question 1 had two parts, and Question 4 presented a dichotomy. The interview questions were asked sequentially. The questions were piloted with volunteers who were not included in the study. All interviews were transcribed.

Validity and reliability

Three areas of validity were addressed: face, construct, and content. Face validity, which determines whether the instrument measures what it claims, was performed by developing a succinct and thorough interview protocol that helped to prevent possible misunderstandings among the participants regarding the study's focus. Construct validity, which tested for theoretical dyslexic experiences, was addressed in two ways: (1) participants were made aware of the study's intent, which helped to direct their responses, and (2) participants aligned their responses with a specific research question. Since few studies exist on students with dyslexia in postsecondary settings, content validity, which guarantees a thorough representation of the construct, was determined by an extensive literature review that necessitated additional analysis of students with dyslexia in secondary education settings.

Relative to reliability, the researcher prepared a short PowerPoint (PPT) to assist in the interview process. The PPT eliminated paper rustling and non-related conversations, and enabled participants to focus on a specific question. The PPT also allowed participants the opportunity to see each question and prepare to respond.

Data analysis

NVivo was used to transcribe the data and analyze it for themes. Deductive analysis was conducted to extrapolate themes,

aggregate interviews, and enable narrative generation. Inductive analysis was used to extrapolate the intention of participants for whom small details were left out. The process consisted of transcribing data, cleaning data, identifying themes, solidifying nodes, and interpreting data.

RESULTS

Evidence from post-secondary students who show no signs of dyslexic traits indicates that there is a fundamental flaw in the approach taken toward teaching students in higher education. Namely, the existing one-size-fits-all academic approach poses a problem for more than just students with LDs.

Based on previous theories and research, the researcher expected to find the following: (1) students employ mechanisms that utilize their strengths to succeed (rather than trying to correct their deficits), and (2) the dyslexic label has done more harm than good in terms of improving academic outcomes and progress. Analysis of interview responses indicated that 16 of the 30 respondents had undergone a formal assessment for dyslexia at some point in their lives. Fourteen participants had no previous formal assessments.

Question 1: Academic challenges and impact on experience

This question was divided into two parts. Findings for the first part of the question revealed that the dominant challenges participants faced were associated with reading, distractions, and/or switching letters and numbers, whereas the second part assessed the impact of those challenges on postsecondary education.

Part 1: Challenges

Reading*:* The challenge participants mentioned most often was reading. Of the total sample, 60% (*n* = 18) mentioned having to re-read materials, and of these, nine participants (female, *n* = 6; male, *n* = 3) mentioned that they needed to read materials two or three times. Five participants (female, *n* = 3; male, *n* = 2) mentioned re-reading materials four or five times to comprehend it, while four participants (female, *n* = 2; male, *n* = 2) said they needed to re-read materials six times or more. For many participants, these problems were associated with comprehension, transposing letters or words, or over-anticipating by allowing their minds to think ahead of what they were going to read.

Distractibility: The second most common challenge was distraction. Twenty-one (female, *n* = 11; male, *n* = 10) participants indicated they found paying attention to be incredibly challenging. Nine students (female, *n* = 3; male, *n* = 6) mentioned being easily distracted in class. This indicates that people with dyslexia are easily distracted by changes in their surroundings (Davis and Braun, 2010; LDA, 2012).

Other challenges: Participants said they reversed letters (female, *n* = 3), and/or reversed numbers (female, *n* = 5; male, *n* = 1). Six respondents (female, *n* = 5; male, *n* = 1) mentioned that they switched around whole words while reading or writing. Six female respondents reported that they had experiences where they knew what they wanted to say but were temporarily unable to access the correct word when speaking or writing. Additionally, six female participants noted that they experienced problems when recalling words and details. Two participants, one female and one male, indicated that they tended to write essay paragraphs out of sequence, and then switched them around. One student said she was able to read silently, but had difficulty reading aloud.

Part 2: Impact of dyslexia on college experiences

In part two of Question 1, participants acknowledged experiencing both positive and negative consequences of their dyslexic traits, but the primary experiences were negative for most respondents. The barriers participants noted were either internal (e.g., embarrassment, fear, and/or insecurities) or external (e.g., discontinuity, non-nurturing environments, lack of presence, and/or resource deficits). Respondents also raised concerns regarding social stigma and labeling. Many reported experiences that left them feeling embarrassed in academic settings. Notably, the effects of being labeled have a lot to do with one's self-image (Pino and Mortari, 2014). The internal barriers participants experienced the most were personal embarrassment (female, *n* = 6; male, *n* = 3) and fear (female, *n* = 4; male, *n* = 3). Only three participants mentioned feeling academically insecure and claimed they did not answer a previous written or verbal question because of past mistakes, which made them doubt their intellect and ability.

Academic barriers: Learning new material is a challenge for any student; however, it was hypothesized that students with dyslexia would have more problems associated with institutional barriers (Clouder et al., 2016). Findings have supported this hypothesis. Some of the barriers documented in the literature include discontinuity, a non-nurturing environment, a lack of presence, and a lack of resources (Lambert and Dryer, 2018). Six students reported issues with discontinuity (female, *n* = 4; male, *n* = 2). In addition, 67% of the female students (*n* = 13) mentioned a non-nurturing academic environment. Interestingly, no male participants mentioned a non-nurturing environment, which could be attributed to gender differences. No student reported a

lack of presence, and only one female student mentioned a lack of resources.

Question 2: Helpful academic strategies

Learning styles: Respondents indicated that a wide variety of strategies and learning styles helped them cope with the rigorous coursework associated with post-secondary education. Overall, six learning modalities have been identified as possible mechanisms for students with dyslexia to improve comprehension: visual, auditory, analytic, tactile, kinesthetic, and global. Three of these modalities stood out among the participants: visual (*n* = 20; 12 female, 8 male), auditory (*n* = 11; 6 female, 5 male), and analytic (*n* = 10; 5 female, 5 male). Earlier studies by Pashler et al. (2009), Chick (2010), and Xu (2011) acknowledged the non-existence of evidence validating the claim that providing opportunities for students to use their preferred learning styles improves learning. In contrast, studies with diverse ethnic groups indicate that preferred learning styles can be understood to be among students' strengths (Richardson, 2015; Widharyanto and Binawan, 2020). Moreover, according to Stienen-Durand and George (2014), "it may be beneficial to consider dyslexia as an alternative learning style" (p. 420).

Some participants explained that it is difficult for them to focus on content that is not presented in their preferred modality. Some reported an inability to focus on information that is not presented either visually or auditorily, thus making learning through reading quite difficult for these students.

Academic tools: The most cited learning strategies among participants were note-taking, reading, and asking for help. Twenty-two participants (73%) used some form of note taking as a learning strategy. The strategies associated with this tool were index cards, post-it notes, and highlighters. Students also cited effective strategies they employed when reading, with the next most cited learning strategy being reading out loud, followed by rereading the material several times. Other strategies consisted of interacting with the text with objects such as rulers or the participant's hands, reading the subtitles, or organizing based on bold text in the reading material.

Questions 3 and 4: Types of support available and used by participants

There are two types of support available to students with disabilities: provisions and accommodations. Provisions are physical facilities meant to aid students, such as libraries, tutoring centers, and computer labs. These also include human resources, such as teachers, other students, and counselors. Accommodations consist of services such as disability testing, note-taking assistance, or assisted technology.

The analysis revealed that 80% of participants knew of and used the provisions available on campus, while only 43% knew of and used accommodations. According to MacCullagh et al. (2016), one accommodation often utilized is that of time-and-a-half offered during test-taking. In contrast, Pino and Mortari (2014) posited that "alternative assessment modalities" provide better test taking options (p. 361). Nevertheless, it is obvious from data in the present study that accommodations were not well known and were in fact underutilized by the participants. Notably, the interviews indicated that the students who used academic accommodations found them extremely useful and helpful. Several respondents indicated that they did not feel they would be able to succeed in higher education without access to these accommodations.

Question 5: College journey and academic standing

Only 18 participants (female, *n* = 10; male, *n* = 8) voluntarily revealed their grade point average during the interviews, while an additional four gave a subjective estimate of their current standing. From these results, it was difficult to determine an overall perspective on academic standing among participants. Without knowing the academic performance levels of all the students who participated in the interviews, it was difficult to say if they performed better or worse, on average, than other students. It was also difficult to ascertain the degree to which the use of accommodations or learning strategies impacted students' academic success.

Character traits: Some students (female, *n* = 1; male, *n* = 4) cited internal character traits as cognitive strengths that helped them succeed academically. The three most cited traits were perception (female, *n* = 3; male, *n* = 13), persistence (female, *n* = 9; male, *n* = 4), and resiliency (female, *n* = 7; male, *n* = 4). Perception is characterized by heightened imagination, metacognition, and altered perception. LoGuidice (2008) indicates that intuitiveness has a strong association with perception. Persistence and resiliency broadly refer to being able to overcome challenges. Resilience enables post-secondary students with dyslexia to manage their academic challenges (MacCullagh et al., 2016).

Other internal strengths: Eight participants (female, *n* = 1; male, *n* = #7) specifically mentioned using imagination as a learning tool. Five students (female, *n* = 1; male, *n* = 4) indicated that they thought in pictures, and two more mentioned thinking intensely about academic tasks. Seven participants (female, *n* = 2; male, *n* = 5) reported that they used their visual imagination, or creativity, to help them learn new material. Three noted they were known for their creative ideas. Entrepreneurs, engineers, and artisans are a few careers where adults with dyslexia

often thrive because of their creative abilities (LoGuidice, 2008; Sunday, 2015). The creative driving force is neurobiological hyper-order brain activity (Pierangelo and Giuliani, 2007; Richardson, 2015), which functions at rapid speeds (Moore, 2014). Research recognizes the "[m]ultiple hypo theses" relative to dyslexic deficits (D'Mello and Gabrieli, 2018). However, new studies on adults with dyslexia yield findings that report an additional narrative, one that centers on dyslexic creativity and not conformity.

DISCUSSION

Students reported a variety of internal challenges associated with attending higher educational institutions, such as reading difficulties, distractibility, switching letters and numbers, and short-term memory problems. Some students also reported knowing what they wanted to say but being unable to access the correct words to write or speak in a timely manner. Students reported feelings of embarrassment, fear, and insecurity associated with attending post-secondary institutions. Many students reported having negative experiences previously, which made them insecure about their abilities.

Despite these and other challenges, several reported that an internal driver propelled them to pursue their post-secondary goals. Thus, these students were very adept and creative in the strategies they used to overcome their challenges. Many had developed an understanding of their learning styles through experience and actively used them to improve their comprehension of course materials. Students reported utilizing visual aids, note-taking, using their imagination, tutoring, reading aloud, rereading material, and physically interacting with coursework to improve their knowledge retention.

As explained above, literature on LDs tends to focus on the "deficit" aspect of disorders and seeks to expose the qualities that are lacking in comparison to "normal" individuals. This is the nature of disorders in general, as they can only be conceptualized in terms of a standard "normal" benchmark. However, it is clear from the responses of the individuals interviewed in the present study that the strategies used to overcome their weaknesses did not involve correcting what was "wrong," but were centered on compensating by developing other strengths.

It is also clear from these interviews that, despite massive challenges, students can do well in a post-secondary environment. Although only about half of the students provided details regarding their academic performance, few reported not doing well enough to pass. If students with a "disability" can perform well by employing certain learning strategies, and the retention rate for higher education is only about 60% overall, does it make sense to classify these students as "disabled?" All students do not learn new material easily and benefit from receiving extra help (Richardson, 2015). Research indicates that prior knowledge aids reading, comprehension, and retention (Reisman and Severino, 2021). Therefore, many of the resources and strategies used by students with LDs could be particularly useful if made available to the general student population and may very well improve the graduation rate for all students.

Accordingly, this researcher advocates for a paradigm shift. The expectation among many students is that lectures and readings are sufficient to learn course material. However, students who succeed academically often engage much more actively with their studies, and this was common among the students in this study who grapple with dyslexia. Perhaps what is needed is a change in the conceptualization of the learning environment to accommodate learners of all types (e.g., UDL). This would save students with LDs from the social and psychological repercussions of being labeled "disabled" and make higher learning much more accessible to all students.

The implications of the present study for stakeholders—students, teachers, support staff, and politicians—can be summed up accordingly. The higher educational environment should be nurturing and provide adequate accommodations (e.g., supports and assistive technology) that are clear, repeatedly advertised, and accessible. Academic success in higher education for students who contend with dyslexia necessitates UDL. Griful-Freixenet et al. (2020) validated the essentiality of implementing different forms of representation (information delivery), engagement (interactive participation), and expression (competency performance). Students who have dyslexic traits should also have the freedom to utilize their inner strengths, rather than be forced into struggling to fit the mold of traditional, standardized educational development.

The limitations of this study are those inherent in qualitative studies. The researcher did not use a formal diagnostic tool to assess participants' status as dyslexic or require participants to be formally diagnosed. The non-experimental nature of this study makes it difficult to compare these students to the general population. Self-reports are not always reliable (Reisman and Severino, 2021). The strategies used for analysis carry the possibility of experimenter bias, as the researcher's judgment is a factor. Future research could explore this concept more experimentally by comparing the challenges and strategies used by students with and without LDs. Further, since extraordinarily little research exists on adults with dyslexia, researchers should also attempt to assess the actual academic impact of the disorder more rigorously, focusing on developing compensatory skills rather than on correcting deficits.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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Investigating the relationship between innovation competencies of school principals and innovation level of schools

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The purpose of this study is to determine the relationship between level of innovation competence of school principals and innovation level of schools with the opinions of teachers working in Vocational and Technical Anatolian High Schools. The research was designed with the correlational survey model. The research population consists of 306 teachers working in the Vocational and Technical Anatolian High Schools in the center of Giresun in the 2019/2020 academic year. According to results obtained from the research, the relationship between innovation competence of the school principals and innovation levels of the schools is at the middle level. There are statistically significant differences in the views of teachers about the sub-dimensions of innovation competencies of school principals according to gender and age variables. There is no statistically significant difference in terms of branch, educational background, professional seniority and duty duration variables. According to the teachers' opinions, it was found that the innovation level of schools did not differ significantly according to age, branch, education level, professional seniority and duty duration at school. Statistically significant difference was found in the teachers' opinions regarding the organizational barriers sub-dimension of the innovation levels of the schools according to the gender variable. At the end of the research, it is recommended that studies be conducted on the innovation competencies of school administrators and the innovation level of schools and to support innovative applications especially for vocational and technical education.

Key words: Innovation, innovation competence, innovative school, vocational and technical high school teachers and principals.

INTRODUCTION

The world is a place of constant change, transformation and revolutions. This rapid change not only affects systems but also affects social structures including schools, education systems and methods significantly. Therefore, schools and education systems that cannot keep up with the changes lose their being effective day by day. Therefore, schools and education system must take necessary steps to be compatible with the ongoing

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changes experienced (Öztemel, 2018, p. 27).

As a result of rapid change in society and technology, there is need for innovation in educational organizations and the idea of innovation has started to prevail among professionals in the field of education. In the context of educational organizations, innovation is an expression of the process of realizing a new change together with the components and stakeholders of the school (Aslan and Kesik, 2016, p. 465). Practices such as changes made to improve educational programs, in-service trainings for educators, measuring their effects by applying renewed teaching methods and techniques, updating educational buildings and classrooms according to the development levels and characteristics of students are considered as examples of innovation (Keleşoğlu, 2017, p. 54).

Educators are now aiming to teach skills such as informed citizenship, problem solving, entrepreneurship, informed communication, problem solving skills, critical thinking, information and media literacy. At this point, it has become an important necessity to carry out innovative studies in all education levels and to carry out the innovation management properly (Öztemel, 2018, p. 27). By increasing the quality of vocational and technical education, it is possible to raise up-to-date, creative, productive individuals who are successful and special in practice as well as their technical knowledge.

Educational institutions, especially vocational and technical education institutions have an important and effective function in the economic and social development of a country. In vocational and technical education institutions, students are aimed to be occupied with knowledge, skills, attitudes and professional ethics in the field they choose in line with their interests and abilities (Eraslan, 2014). Vocational and technical education students are expected to follow and apply developing technology, to be creative and have the ability to solve problems, so they can effectively contribute workforce needed by the society. For this reason, schools must be sufficiently innovative to educate students as required by millennial requirement.

In this context, the opinions of the teachers working in vocational and technical educational institutions, on innovation competencies of school principals and the innovation levels of schools is important to understand the current innovative studies in those institutions where the manpower is trained to meet the needs of today.

When related literatures were examined, there were limited studies on the innovation competencies of school principals and the innovation levels of schools. (Beycioğlu, 2004; Top, 2011; Bülbül, 2012a, b Göl and Eraslan, 2012; Ömür, 2014; Özkan, 2015; Kurt, 2016, Aslan and Kesik, 2016; Erdemet, 2017). The research indicated that to carry out innovation studies in schools and to transform schools into innovative organizations, the social environment must have a supportive structure. Besides a formal environment with personnel support in providing resources, to create an innovative school culture, conditions such as shared leadership and vision, a motivating climate and ensuring the participation of all stakeholders in the innovation process are required (Aslan and Kesik, 2016, p. 465). At this point, school administrators have an important role in recognizing employers needs with innovation opportunities, initiating and implementing innovation studies.

Innovation levels of schools may vary according to the innovation competencies of school principals. This is an important finding that will enable the reconsideration, review, planning and updating of school management processes. Therefore, this study aims to determine the relationship between the innovation competencies of Vocational and Technical Anatolian High School principals and the innovation levels of the schools. Consequently, the following research questions were sought to be answered.

1. What are the innovation competencies of school principals based on the opinions of Vocational and Technical Anatolian High School teachers?
2. Do the opinions of Vocational and Technical Anatolian High School teachers on innovation competencies of principals significantly change based on gender, age, educational background, major, professional seniority?
3. What are the innovation levels of schools according to the opinions of Vocational and Technical Anatolian High School teachers?
4. Do the opinions of Vocational and Technical Anatolian High School teachers on innovation levels of schools significantly change based on gender, age, educational background, major, professional seniority?
5. Is there a statistically significant relationship between the innovation competencies of Vocational and Technical Anatolian High School principals and the innovation levels of the schools they work?

METHODS

Design

Research models aimed to determine whether there is a relationship between two or more variables and the degree of relationship are called correlational studies (Karasar, 2012, p. 81). The current research aim to determine the relationship between innovation competencies of school administrators in Vocational and Technical Anatolian High Schools and the innovation levels of schools. Therefore, this study is a cross sectional correlational study.

Participants

The scope of the research consists of 306 teachers working in Vocational and Technical Anatolian High Schools in Giresun city center in the 2019-2020 academic year. There are 7 Vocational and Technical Anatolian High Schools in Giresun city center.

Due to availability of the research population, we planned to run the study over the whole population without sampling. Research

data were collected from 7 Vocational and Technical Anatolian High Schools in the city center. However, 220 out of 306 teachers completed the measurement tools on a voluntary basis. In this way, the population of the research was determined as 220. Research analyzes were carried out in this direction.

Most of the participants were female 117 (53.2%) and 103 (46.8%) of the participants were male. Most of the participants were between the age group 41-45 and over the age of 51. Of the 220 participants, 12 (5.5%) were in the 26-30 age range, 12 (5.5%) in the 31-35 age range, 44 (20.0%) in the 36-40 age range, 56 (25.5%) in the 41-45, 40 (18.2%) in the age range of 46-50, 50 (25.5%) were in the age range of 51 and over. 220 participants (69.1%) had bachelor's degree, and 68 (30.9%) of them had master's degree or higher. 108 (49.1%)participants were teaching vocational classes, and 112 (50.9%) were teaching general course classes. Eight (3.6%) participants had a seniority of 1-5 years, 20 (9.1%) had a seniority of 6-10 years, 16 (7.3%) had a seniority of 11-15 years, 44 (20.0%) had 16-20 years seniority, 52 (23.6%) had 21-25 years seniority, and 80 (36.4%) had 26 years or more. 76 (34.5%) participants reported to work in the same school between 1-5 years, 44 (20.0%) were between 6-10 years, 40 (18.2%) were between 11-15 years, 6 (7.3%) were between16-20 years, (9.1%) were between 21-25 years and 24 (10.9%) were for 26 years or more.

Procedures

After ethical approval was obtained from the respected organizations (Giresun University and Giresun Provincial Directorate of National Education (Annex-1)), the researchers contacted school administrators in regard to the study. The research data were collected in the second term of the 2019-2020 academic year with the help of school administrators. The potential participants were informed about the purpose and importance of the research and how the data set would be answered. It has been stated to the participants that the participation is totally voluntarily and not participating in the study would not have any negative effect on them. Also, it was indicated that the data will be evaluated collectively and no personal information would be collected. The volunteer participants were provided a survey packet to be completed and the response time to complete the survey packet was approximately 15-20 min.

Measurement

The data collection tools used in the study are Personal Information Form, Innovation Competence Scale of School Administrators and Innovative School Scale.

Personal information form

The first data collection tool to be used in the research is the "Personal Information Form" prepared by the researcher and shown in Annex 2. This data collection tool consists of 6 questions in total, asking about gender, the age group, educational status; branch; seniority in the profession, and the duration of service in the institution where they work.

Innovation competence scale of school administrators

In the study, the "Innovation Competencies Scale of School Administrators" developed by Eraslan (2014) was used to examine the opinions of Vocational and Technical Anatolian High School teachers and school administrators on innovation competencies in the city center of Giresun and how these views differ according to various variables. Necessary permissions were obtained from the researcher who developed the scale (Annex 3).

The data collection tool was developed by Eraslan (2014) using the relevant literature and consists of 25 questions in total. The scale includes five factors. The participants were asked to evaluate using the 5-point Likert scale questions ranging from 1 "I absolutely disagree", 2 "I do not agree", 3 "I have no idea", 4 "I agree", 5 "I absolutely agree".

The scale consists of 5 sub-dimensions, with 7 items in the first sub-dimension, "Sensitivity to Change". These items indicate that school staff are supported in presenting their talents in the process of change, cooperation is the best way of efficiency in school, the need for change is clearly expressed by administrators, and the decisions and practices taken in the change process are consistent and ethical.

There are 3 items in the second sub-dimension "In-School Communication". These items reflect administrators contacting their employees closely and expressing they support team work that they do not let the communication break.

There are 3 items in the 3rd sub-dimension "Out-of-School Communication" dimension. These items express that there is an effective communication between the school and the environment, there is a satisfactory communication in the process of change, and school administrators are sensitive to the environment during the change process.

There are 6 items in the "Leadership" dimension which is the 4th sub-dimension. These items indicate that school administrators have a solid vision in the process of change, that school administrators know their employees sufficiently, that school administrators have the power to influence employees, that employees are actively involved in the process of change, that school administrators help employees to adapt to the change process, and expressing that they share leadership for development.

There are 6 items in the 5th sub-dimension "Motivation". These items are items that express that school administrators support employees' goals for advancement in their careers, appreciate and reward those who fulfill successfully completed tasks and those who are successful in their jobs, try to motivate their employees for change, and help employees in solving the problems they encounter.

The internal consistency reliability coefficients were calculated in order to determine the reliability level of the sum and sub-dimensions of the School Administrators Innovation Competencies Scale. The internal consistency coefficient of the sum of the School Administrators' Innovation Competencies Scale is calculated to be $\alpha = 0.797$. As for its sub-dimensions, the internal consistency reliability level of the sensitivity to change dimension is $\alpha = 0.81$; Internal consistency reliability level of the intra-school communication dimension is $\alpha = 0.67$; Internal consistency reliability level of out-of-school communication dimension is $\alpha = 0.60$; Internal consistency reliability level of leadership dimension is $\alpha = 0.71$; and Internal consistency reliability level of motivation dimension was found as $\alpha = 0.79$. Since the reliability of the total and sub-dimensions of the scale is between $\alpha = 0.60$ and $\alpha = 0.81$ (Sümer et al., 2005, p. 219), it is possible to say that it is reliable.

Innovative school scale

In the study, "Innovative School Scale" developed by Aslan and Kesik (2016) and seen in Annex 2 was used in order to determine the innovation levels of Vocational and Technical Anatolian High Schools located in Giresun city center. Necessary permissions were obtained from the researcher who developed the scale (Annex 3). The scale consists of 19 questions and 3 sub-dimensions. For the 1st, 2nd and 3rd sub-dimensions, the participants were asked to

evaluate using a 5-point likert type scale as 5 “Always”, 4 “Most of the time”, 3 “Sometimes”, 2 “Rarely”, 1 “Never”.

There are 6 items in the "Innovative Atmosphere" dimension, which is the first sub-dimension of the scale developed to determine teachers 'perceptions of their schools' innovativeness. These items express that trust between administrators and staff is high, that all school staff are included in the problem-solving process, common goals are shared by school staff, a shared vision is created to ensure innovation, there is a climate that encourages creativity and that ideas are respected.

There are 7 items in the 2nd sub-dimension "Administrative Support". These items reflect that teamwork is supported for innovation, everyone fulfills their duty to realize innovations, individuals are allowed to try new things, teachers are able to make innovative decisions, everyone is willing about innovations, they are evaluated with the contributions they make to the school, and that every difference is seen as a wealth.

There are 6 items in the 3rd sub-dimension "Organizational Barriers". These items express that school members are afraid of taking risks, that innovation is not an organizational goal based on the school, that employees find it as unknown and scary, that they try to protect the current situation instead of innovation, and that entrepreneurial and innovative people face bureaucratic and organizational obstacles. The internal consistency reliability coefficient of the scale was found to be 0.84.

Data analysis

The obtained data were coded by the researcher and first entered into the Excel 2010 program, and then transferred to the SPSS 22 program and analyzed. For all statistical calculations, the significance value of "0.05" was accepted.

RESULTS AND DISCUSSION

The analyses made on the data collection tools applied to the participants for the sub-objectives of the study, and includes the findings along with comments pertaining to it.

Findings and comments on innovation competencies of school principals

Here, analyzes and findings related to the innovation competencies of school principals are presented according to the opinions of teachers.

Findings and comments on dimensions and items of the school principals' innovation competencies scale

Here, descriptive analyzes are included to determine the innovation competencies of school principals according to the opinions of teachers working in Vocational and Technical Anatolian High Schools, which is the second sub-objective of the study. The analyses are reported separately for the dimensions that make up the scale. In the analyses, the answers given for each item in the "Innovation Competence Scale" It was evaluated as “1- Absolutely disagree, 2- Disagree, 3-No idea, 4- Agree, 5- Strongly agree”. The interpretations regarding the arithmetic mean are made in line with the following explanation: The viewing ranges for each item were determined as follows: Arithmetic mean ($\bar{X}$) for any item of scale; if the arithmetic mean of the relevant item;

- is between $1 \leq \bar{X} < 1.8$, the participants "strongly disagree", "I absolutely disagree",
- is between $1.8 \leq \bar{X} < 2.6$, participants do not agree with the opinion in the related item, "Disagree",
- is between $2.6 \leq \bar{X} < 3.4$, participants "partially agree" about the opinion in the relevant item, "I have no idea",
- is between $3.4 \leq \bar{X} < 4.2$, the participants "agree", "I agree" to the opinion in the relevant item,
- is between $4.2 \leq \bar{X} < 5.00$, it is stated that the participants “strongly agree”, “I absolutely agree” with the opinion in the relevant item.

Findings and comments on dimensions of the innovation competence scale of school principals

Within the scope of this study, the average, minimum and highest scores and standard deviation values obtained by combining the answers given to the items that constitute the dimensions of the "Innovation Competencies Scale" of school principals according to the opinions of teachers working in Vocational and Technical Anatolian High Schools are summarized in Table 1.

According to the average values (sensitivity to change X cevap = 3.711; In-school communication $\bar{X}$ = 3,684; Motivation $\bar{X}$ = 3,654; Leadership $\bar{X}$ = 3,554; Out-of-school communication $\bar{X}$ = 3,497), it is seen that they express their opinions at the level of "I agree" for each of the qualifications of proficiency.

In Table 1, teachers show the characteristics of school principals' sensitivity to change (sensitivity to change $\bar{X}$ = 3.711), in-school communication ($\bar{X}$ = 3,684), motivation ($\bar{X}$ = 3,654), leadership ($\bar{X}$ = 3,554) and out-of-school communication (Out-of-school communication $\bar{X}$ = 3,497) according to their properties.

According to these findings, it can be said that according to the opinions of teachers working in Vocational and Technical Anatolian High Schools, school principals have the characteristics of sensitivity to change, in-school communication, motivation, leadership, and out-of-school communication, respectively.

Examining the opinions of school principals on innovation competencies according to the personal information of teachers working in Vocational and Technical Anatolian High Schools

Here, the opinions of teachers working in Vocational and Technical Anatolian High Schools, which are the 2nd sub-purpose of the research, regarding the innovation competence of school principals are presented. Analysis

Table 1. Descriptive statistical value related to the dimensions and items of the innovation competence scale of school principals according to the opinions of teachers working in Vocational and Technical Anatolian High Schools.

Dimension	N	No. of ıtems	Lowest score	Highest score	$\bar{X}$	Ss
Sensitivity to change	220	7	1.00	4.86	3.711	0.76815
İntramural communication	220	3	1.00	5.00	3.684	0.88603
Out of school communication	220	3	1.00	4.67	3.497	0.75616
Leadership	220	6	1.00	5.00	3.554	0.89763
Motivation	220	6	1.00	5.00	3.654	0.87171
Total	220	25	5.00	24.53	3.636	0.79171

Table 2. Independent sample t test results regarding the differences between the innovation competence scores of school principals according to the gender of teachers working in Vocational and Technical Anatolian High Schools.

Dimension	Group	N	$\overline{X}$	Ss	t	df	p
Sensitivity to change	Male	103	3.8419	0.59540	2.441	204.999	0.015
	Woman	117	3.5971	0.87975			
İntramural communication	Male	103	3.7994	0.71300	1.847	208.779	0.066
	Woman	117	3.5840	1.00659			
Out of school communication	Male	103	3.5275	0.69784	0.561	218	0.575
	Woman	117	3.4701	0.80605			
Leadership	Male	103	3.6117	0.74110	0.902	210.937	0.368
	Woman	117	3.5043	1.01626			
Motivation	Male	103	3.6812	0.56404	0.441	179.973	0.660
	Woman	117	3.6311	1.07408			

*Significant at p <0.05 level.

of results and comments on whether there is a statistically significant difference according to the variables of gender, age, education level, branch, seniority and working time at school are included.

Findings and comments on examination of school principals' innovation competencies according to the gender variable

Independent samples test was conducted in order to make comparison according to gender in five dimensions of the scale for the opinions of teachers working in Vocational and Technical Anatolian High Schools and school principals on innovation competence. The results of the test are given in Table 2.

In Table 2, among the opinions of the teachers participating in the research on the innovation competence of the school principals, according to gender, it was observed that there was no statistically significant difference in the characteristics of in-school communication (p>0.05), out-of-school communication (p>0.05), leadership (p>0.05) and motivation (p> 0.05). A statistically significant difference was found in the sensitivity to change feature (p <.05). Looking at the average scores of male and female teachers (Female $\bar{X}$ = 3.5971; Male $\bar{X}$ = 3.8419), it can be said that school principals are more susceptible to change according to the views of male teachers.

Findings and comments on examination of managers' opinions on innovation competencies according to the age variable

According to the age variable, a one-way ANOVA was performed to determine whether there was a statistically significant difference between the opinions of the teachers participating in the study and the school principals' innovation competencies. The mean scores of

Table 3. Descriptive statistical values of the scores of teachers working in vocational and technical anatolian high schools regarding innovation competencies of school principals according to their ages.

Dimension	Age (years)	N	X̄	Ss
Sensitivity to change	26-30	12	3.1905	1.62235
	31-35	12	3.3810	0.73435
	36-40	44	4.0390	0.53396
	41-45	56	3.7347	0.60880
	46-50	40	3.6000	0.85298
	Over 50	56	3.6939	0.65348
	Total	220	3.7117	0.76815
İntramural communication	26-30	12	3.4444	1.61641
	31-35	12	3.2222	0.59175
	36-40	44	3.9697	0.85610
	41-45	56	3.5952	0.54203
	46-50	40	3.5333	0.99228
	Over 50	56	3.8095	0.89636
	Total	220	3.6848	0.88603
Out of school communication	26-30	12	3.0000	1.47710
	31-35	12	3.4444	0.43423
	36-40	44	3.3939	0.78511
	41-45	56	3.4762	0.47079
	46-50	40	3.6000	0.83785
	Over 50	56	3.6429	0.71310
	Total	220	3.4970	0.75616
Leadership	26-30	12	3.1667	1.61433
	31-35	12	3.2222	0.53811
	36-40	44	3.9091	0.86075
	41-45	56	3.5238	0.66926
	46-50	40	3.4000	0.97021
	Over 50	56	3.5714	0.87089
	Total	220	3.5545	0.89763
Motivation	26-30	12	3.1667	1.48392
	31-35	12	3.3333	0.98473
	36-40	44	3.8939	0.77183
	41-45	56	3.7381	0.65045
	46-50	40	3.6333	0.93918
	Over 50	56	3.5714	0.86156
	Total	220	3.6545	0.87171

the school principals' opinions on innovation competencies according to the age of teachers are presented in Table 3. One-way ANOVA results for determining whether the differences between teachers' mean scores are significant or not are shown in Table 3.

According to the age variable, a one-way ANOVA was conducted to determine whether there was a statistically significant difference between the views of the teachers participating in the study and the school principals' innovation competencies. The average scores of the school principals' opinions on innovation competencies according to the age of teachers are presented in Table 3. One-way ANOVA results for determining whether the differences between the teachers' mean scores are significant or not are shown in Table 4.

According to the age of teachers working in Vocational and Technical Anatolian High Schools (20-25 years old, 26-30 years old, 36-40 years old, 41-45 years old, 46-50

Table 4. One-way ANOVA results regarding the differences between the innovation competence scores of school principals according to the ages of teachers working in Vocational and Technical Anatolian High Schools.

Dimension	Variance Source	Sum of Squares	SD	Mean Squares	F	p
Sensitivity to change	Between groups	481,752	5	96,350	3.525	0.004
	Within groups	5850,175	214	27,337		
	Total	6331,927	219			
İntramural communication	Between groups	81,633	5	16,327	2.384	0.039
	Within groups	1465,713	214	6,849		
	Total	1547,345	219			
Out of school communication	Between groups	45,941	5	9,188	1.819	0.110
	Within groups	1081,041	214	5,052		
	Total	1126,982	219			
Leadership	Between groups	348,689	5	69,738	2.486	0.033
	Within groups	6003,747	214	28,055		
	Total	6352,436	219			
Motivation	Between groups	266,826	5	53,365	1.995	0.081
	Within groups	5724,010	214	26,748		
	Total	5990,836	219	96,350	3.525	

years old, 51 years old and over), one-way ANOVA results were given to determine whether there is a statistically significant difference between the opinions about the competencies. In the results obtained, according to the age of the teachers, no statistically significant difference was found between school principals' views on innovation competencies, out-of-school communication ($p > 0.05$) and motivation ($p > 0.05$) sub-dimensions. However, a significant difference was found between the dimensions of sensitivity to change ($p < 0.05$), intra-school communication ($p < 0.05$) and leadership ($p < 0.05$). Considering average scores of these three groups, it can be said that teachers between the ages of 26-30 ($\bar{X} = 3.190$) and teachers between the ages of 31-35 ($\bar{X} = 3.381$) report less positive opinions on the sensitivity of school principals to change than other age groups. In the in-school communication dimension, it can be said that teachers in the age group of 31-35 ($\bar{X} = 3.222$) report less positive opinions than teachers in the other age group. In the leadership dimension, it can be said that teachers between the ages of 26-30 ($\bar{X} = 3.166$) and teachers between the ages of 31-35 ($\bar{X} = 3.222$) report less positive opinions about the leadership behaviors of school principals than other age groups.

Findings and comments on examination of school principals' innovation competencies according to the educational status variable

A one-way ANOVA was planned to determine whether there was a statistically significant difference between the teachers' views on innovation competencies of the school principals, but independent sample t test was applied between the language and master's variables since there was no participation from the participants at associate degree and doctorate level. Independent samples t test results to determine whether the difference between the mean scores are significant or not are shown in Table 5.

As regards educational status of teachers participating in the research in Table 5, and among the opinions of the school principals on innovation competence, there was no statistically significant difference in the characteristics of sensitivity to change ($p > 0.05$) and school communication ($p > 0.05$). A statistically significant difference was found in out-of-school communication ($p < 0.05$), leadership ($p < 0.05$) and motivation ($p < 0.05$) dimensions. Considering the average scores of teachers with undergraduate and graduate degrees in all three dimensions, it can be said that teachers with a master's degree think that school principals have more out-of-school communication, leadership and motivation characteristics than graduate teachers.

Findings and comments on examination of school principals' opinions on innovation competencies according to the branch variable

Independent samples test was conducted in order to make comparisons according to branches in five

Table 5. Independent sample test results for the innovation competencies of school principals according to the educational status of teachers working in Vocational and Technical Anatolian High Schools.

Dimension	Group	N	$\overline{X}$	Ss	t	df	p
Sensitivity to change	License	152	3.6767	0.78895	-1.010	140.537	0.297
	Post graduate	68	3.7899	0.71895			
İntramural communication	License	152	3.6404	0.93460	-1.114	155.853	0.231
	Post graduate	68	3.7843	0.76352			
Out of school communication	License	152	3.4298	0.82958	-1.982	191.065	0.021
	Post graduate	68	3.6471	0.53371			
Leadership	License	152	3.4605	0.92104	-2.347	145.264	0.015
	Post graduate	68	3.7647	0.81050			
Motivation	License	152	3.5702	0.87701	-2.164	134.797	0.032
	Post graduate	68	3.8431	0.83551			

Table 6. Independent sample t test results regarding the differences between the innovation competence scores of school principals according to the branches of the teachers working in Vocational and Technical Anatolian High Schools.

Dimension	Group	N	$\overline{X}$	Ss	t	df	p
Sensitivity to change	Vocational courses	108	3.5820	0.83224	-2.488	206.767	0.064
	Culture lessons	112	3.8367	0.68145			
İntramural communication	Vocational courses	108	3.5556	0.88837	-2.143	217.272	0.053
	Culture lessons	112	3.8095	0.86959			
Out of school communication	Vocational courses	108	3.3827	0.79825	-2.220	212.024	0.077
	Culture lessons	112	3.6071	0.69923			
Leadership	Vocational courses	108	3.3889	0.89303	-2.727	217.341	0.057
	Culture lessons	112	3.7143	0.87663			
Motivation	Vocational courses	108	3.5556	0.91486	-1.661	213.547	0.098
	Culture lessons	112	3.7500	0.82078			

dimensions of the scale for the opinions of teachers working in Vocational and Technical Anatolian High Schools and school principals on innovation competencies. The results of the test performed are given in Table 6.

As regards branch variable, among the opinions of the teachers participating in the study on the innovation competence of the school principals in Table 6, a statistically significant difference in the dimensions of sensitivity to change ($p>0.05$), intramural communication ($p>0.05$), out-of-school communication ($p>0.05$), leadership ($p>0.05$) and motivation ($p>0.05$) has been observed.

Findings and comments on examination of school principals' innovation competencies according to seniority variable

According to the seniority variable, a one-way ANOVA was performed to determine whether there was a statistically significant difference between the views of the teachers participating in the study and the school principals' innovation competence. Table 7 shows the one-way ANOVA results regarding the differences between innovation competence scores of the school principals according to the seniority of the teachers working in Vocational and Technical Anatolian High

Table 7. One-way ANOVA results on the differences between the innovation competence scores of school principals according to the seniority of teachers working in Vocational and Technical Anatolian High Schools.

Dimension	Variance Source	Sum of Squares	SD	Mean Square	F	p
Sensitivity to change	Between groups	10,502	5	2.100	3.786	0.053
	Within groups	118,721	214	0.555		
	Total	129,223	219			
İntramural communication	Between groups	12,816	5	2.563	3.447	0.055
	Within groups	159,111	214	0.744		
	Total	171,927	219			
Out of school communication	Between groups	13,582	5	2.716	5.207	0.070
	Within groups	111,638	214	0.522		
	Total	125,220	219			
Leadership	Between groups	14,249	5	2.850	3.760	0.093
	Within groups	162,208	214	0.758		
	Total	176,457	219			
Motivation	Between groups	10,547	5	2.109	2.896	0.075
	Within groups	155,865	214	0.728		
	Total	166,412	219			

Schools.

In Table 7, according to the seniority of teachers working in Vocational and Technical Anatolian High Schools (1-5 years, 6-10 years, 11-15 years, 16-20 years, 21-25 years, 26 years and above), one-way ANOVA results were given in order to determine whether there is a statistically significant difference between their views on innovation competencies. When the obtained results are examined, according to the seniority of the teachers, it was observed that there was no statistically significant difference between school principals' views on innovation competencies (sensitivity to change $p>0.05$; in-school communication $p>0.05$, out-of-school communication $p>0.05$, leadership $p>0.05$, and motivation $p>0.05$).

Findings and comments on examination of school principals' opinions on innovation competencies according to the variable of working time at the school where they work

A one-way ANOVA was conducted to determine whether there is a statistically significant difference between the views of the teachers participating in the study and the school principals' innovation competencies, according to the variable of working time at the school. One-way ANOVA results regarding the differences between the innovation competence scores of the school principals according to the tenure of the teachers working in the Vocational and Technical Anatolian High Schools are given in Table 8.

Table 8 shows the terms of office of the teachers working in Vocational and Technical Anatolian High Schools (1-5 years, 6-10 years, 11-15 years, 16-20 years, 21-25 years, 26 years and above) one-way ANOVA results were given to determine whether there is a statistically significant difference between school principals' views on innovation competencies. In the results obtained, according to the seniority of the teachers, no statistically significant difference was found between the views of school principals on innovation competencies (sensitivity to change $p>0.05$; in-school communication $p>0.05$, out-of-school communication $p>0.05$, leadership $p>0.05$, motivation $p>0.05$).

Findings and comments on innovative school scale

Here, analysis and findings related to the innovation level of schools are presented according to the opinions of teachers.

Findings and comments on the dimensions and items of the innovative school scale

Here, descriptive analyses for determining innovation levels of schools according to opinions of teachers who work in Vocational and Technical Anatolian High Schools, which is the 4th sub-objective of the research, are

Table 8. One-way ANOVA results regarding the differences between the innovation competence scores of the school principals according to the tenure of the teachers working in Vocational and Technical Anatolian High Schools.

Dimension	Variance Source	Sum of Squares	SD	Mean Square	F	p
Sensitivity to change	Between groups	4,333	5	0.867	1.485	0.196
	Within groups	124,890	214	0.584		
	Total	129,223	219			
İntramural communication	Between groups	5,439	5	1.088	1.398	0.226
	Within groups	166,488	214	0.778		
	Total	171,927	219			
Out of school communication	Between groups	8,369	5	1.674	3.066	0.071
	Within groups	116,851	214	0.546		
	Total	125,220	219			
Leadership	Between groups	3,511	5	0.702	0.869	0.503
	Within groups	172,945	214	0.808		
	Total	176,457	219			
Motivation	Between groups	3,695	5	0.739	0.972	0.436
	Within groups	162,717	214	0.760		
	Total	166,412	219			

Table 9. Descriptive statistical value of the dimensions and items of the Innovative School Scale according to the opinions of the teachers working in Vocational and Technical Anatolian High Schools.

Dimension	N	Item numbers	Lowest score	Highest score	$\overline{X}$	Ss
Innovative Atmosphere	220	6	1.33	5.00	3.6818	0.76866
Managerial Support	220	7	1.71	5.00	3.6468	0.78275
Organizational barriers	220	6	1.33	5.00	3.0485	0.77222

included. The analyses are reported separately for the dimensions and items that make up the scale. Answers are presented in the "Innovative School Scale" 1-13 for substances; 1- Never, 2- Rarely, 3- Sometimes, 4- Most of the time, 5- Always "; 14-19. For the items, they were reverse-coded as 1- Always, 2- Most of the Time, 3- Sometimes, 4- Rarely, 5- Never. The interpretations regarding the arithmetic mean are made in line with the following explanation.

To determine the standard viewing ranges for each item, the formula 4/5 = 0.8 was used. Later, the viewing ranges were determined as follows: the arithmetic mean of any scale item ($\bar{X}$);

(i) If it is between 1 <$\bar{X}$ <1.8, the participants "strongly disagree with the opinion in the relevant item", "Never",
(ii) If it is between 1.8 <$\bar{X}$ <2.6, participants' opinion in the relevant item, "Rarely",
(iii) If between 2.6 <$\bar{X}$ <3.4, the participants' opinion in the relevant item, "Sometimes they agree",
(iv) If it is between 3.4 <$\bar{X}$ <4.2, the participants' opinion in the relevant item, "Most of the time they agree",
(v) If it is between 4.2 <$\bar{X}$ <5.00, the opinion of the participants in the related item is expressed as "I always agree".

Findings and comments on the dimensions of the innovative school scale

According to the opinions of the teachers working in Vocational and Technical Anatolian High Schools, the average, lowest and highest scores and standard deviation values obtained by combining the answers given to the items that make up the three dimensions of the innovative school scale are summarized in Table 9.

When we look at the average values formed by combining the responses given to the items in Table 9, the teachers' level of "Most of the time" agree for each of the innovative school characteristics in the sub-dimensions of Innovative atmosphere ($\bar{X}$ = 3.6818) and Managerial support ($\bar{X}$ = 3.6468). It is seen that they

Table 10. Descriptive statistical values of the items that make up the innovative atmospheric feature dimension.

Item no.	N	$\bar{X}$	Ss
1	220	3.8364	0.80554
2	220	3.5818	0.91043
3	220	3.7636	0.89573
4	220	3.6909	0.91408
5	220	3.3818	0.90641
6	220	3.8464	0.84968

Table 11. Descriptive statistical values of the items that make up the administrative support dimension.

Item no.	N	$\bar{X}$	Ss
7	220	3.8727	0.81211
8	220	3.7091	0.88977
9	220	3.6909	0.91408
10	220	3.6545	0.94058
11	220	3.3636	0.99979
12	220	3.6364	0.86248
13	220	3.6000	1.02213

express their opinions at the level of "Sometimes" in organizational barriers dimension ($\bar{X}$ = 3.0485).

In Table 9, teachers stated that the Innovative Atmosphere ($\bar{X}$ = 3.6818) and Managerial Support ($\bar{X}$ = 3.6468) features were higher than the organizational disability ($\bar{X}$ = 3.0485) characteristics in the schools they work. According to the teachers who participated in the study, it is seen that the schools they work with have innovative atmosphere, administrative support, and organizational barriers, respectively.

Innovative atmosphere dimension

In Table 10, the arithmetic mean and standard deviation values regarding the responses given to the innovative atmosphere-sized substances are given.

When the average of the answers given in the dimension of innovative atmosphere is examined, it is seen that the answers given by the teachers participating in the research are concentrated in the "Most of the Time" option. Based on this finding, it can be said that schools have an innovative atmosphere.

When the averages of the items are examined in Table 10, it is seen that the item with the lowest average is the 5th item with an average of $\bar{X}$ = 3.3818. According to this, it is seen that the teachers at least agree with the view "There is a climate that encourages creativity". It is seen that the item with the highest average is the 6th item with an average of $\bar{X}$ = 3.8464. According to this, it is seen that teachers mostly agree with the view "Everyone's ideas are respected".

Managerial support dimension

In Table 11, arithmetic mean and standard deviation values are given regarding the answers given to the items in the administrative support dimension.

When the average of the responses given in the administrative support dimension is examined, the lowest value (Item 11, $\bar{X}$ = 3.3636) is "Everyone is willing to realize innovations." It is seen that there is an option and teachers participate at the "Sometimes" level. It is observed that the answers given by the teachers for the other items are concentrated in the option "I mostly agree". According to this, it is seen that schools often have the administrative support feature.

Organizational barriers

In Table 12, arithmetic mean and standard deviation values are given regarding the responses given to items in organizational barriers among the innovativeness characteristics of schools.

When the average of the responses given in the organizational barriers feature was examined, it was seen that the answers given by the teachers participating in the research are concentrated in the "Sometimes" option, and that the schools deal with organizational obstacles, cannot take risks and resist change. When the averages

Table 12. Descriptive statistical values of the items that make up the organizational barrier dimension.

Item No.	N	$\bar{X}$	Ss
1	220	2.8545	0.84222
2	220	3.3455	0.97864
3	220	3.0000	0.99313
4	220	2.9455	0.96360
5	220	3.2364	0.99246
6	220	2.9091	1.06882

Table 13. Results of correlation analysis showing the relationship between innovation competencies of school principals and innovation levels of schools.

Correlation		Innovation competencies of managers	Innovative school level
Innovation competencies of managers	Pearson correlation	1	0.578**
	Sig. (2-tailed)		0.007
	N	220	220
Innovative school level	Pearson correlation	0.578**	1
	Sig. (2-tailed)	0.007	
	N	220	220

**: Correlation is significant at the 0.01 level (2-tailed).

of the items in Table 12 are examined, it is seen that the item with the lowest average is the 14th item with an average of $\bar{X}$ = 2.8545. It is seen that the item with the highest average is the 15th item with $\bar{X}$ = 3.3455. Based on this finding, for the schools of teachers participating in the study, "Our school members are afraid of taking risks." While his vision remains low; "Innovation is not a basic organizational goal." It can be said that there is more participation in his opinion.

Findings and comments on the relationship between the ınnovation competencies of school principals and the ınnovation level of schools

Here, correlation analysis of findings regarding whether there is a significant relationship between innovation competencies of school principals, which is the 5th sub-objective of the research, and the innovation levels of schools, are given. In correlation analysis, the coefficient value expressing the relationship between variables varies between +1 and -1. A positive coefficient indicates that an increase in one variable and a negative increase in the other variable indicate a decrease in the other variable when there is an increase in another variable. A correlation coefficient of ± 1 indicates a perfect relationship, and 0 indicates no relationship at all. If the correlation coefficient is less than 0.30, the relationship is weak; If it is between 0.30 and 0.70, it is at medium level; if it is greater than 0.70, it is high (Büyüköztürk, 2015, p. 185). The results of the correlation analysis made are presented in Table 13.

Table 13 shows the results of the Pearson Moments Coefficient Analysis technique, which was made to determine the relationship between the innovation competencies of school principals and the innovation levels of their schools according to the opinions of the teachers participating in the study. In Table 13, it was determined that there is a moderately positive and significant relationship ($r = 0.578$, $p < 0.01$) between the innovation competencies of the school principals of the teachers participating in the research and the innovation levels of the schools. In line with these results, it can be said that as the innovation competencies of school preservatives increase, the innovation levels of the schools increase.

Conclusions

Here, the findings obtained helped to answer the questions regarding the sub-objectives of the research and the suggestions developed in line with these results are included.

The results obtained in this study, in which the effect of the innovation competencies of the principals of Vocational and Technical Anatolian High Schools in Giresun City Center on the innovation levels of the

schools were examined according to the opinions of the teachers, are summarized below.

The results obtained from the analysis to determine the opinions of the teachers of Vocational and Technical Anatolian High School, which is the second sub-objective of the study, on the innovation competencies of school principals, according to the variables of gender, age, education level, branch, professional seniority and tenure at school are as presented.

When looking at the average values of the answers given by the teachers participating in the study to the innovation competencies of the school principals, the sensitivity to change is $\bar{X}$ = 3.711; intra-school communication $\bar{X}$ = 3.684; out-of-school communication $\bar{X}$ = 3.497; leadership $\bar{X}$ = 3,554; and motivation was found to be $\bar{X}$ = 3.654. Accordingly, teachers expressed the view that school principals showed the most sensitive to change feature and the least out-of-school communication competence. According to the opinions of the teachers working in Vocational and Technical Anatolian High Schools, it was stated that school principals have the characteristics of sensitivity to change, in-school communication, leadership, motivation and out-of-school communication, respectively.

The results of the analysis to determine whether the opinions of Vocational and Technical Anatolian High School teachers and school principals on innovation competencies, which are included in the second sub-purpose of the study, show a statistically significant difference according to gender, age, education level, branch, professional seniority and tenure at school are as explained:

According to the gender of the teachers participating in the study, there was no difference in school principals' views on innovation competence in terms of in-school communication, out-of-school communication, leadership and motivation dimensions. A significant difference was found in the sensitivity to change dimension. According to this, the mean score ($\bar{X}$ = 3.8419) of male teachers' views on school principals' sensitivity to change is significantly higher than the average score ($\bar{X}$ = 3.5971) of female teachers' opinions. It has been determined that this difference is in favor of male teachers.

According to the age of the teachers participating in the study, their views of the school principals on innovation competence did not show a statistically significant difference in terms of out-of-school communication and motivation dimensions. Accordingly, a statistically significant difference ($p = <0.05$) was observed between the 26-30 age group teachers and the 31-35 age group teachers in the dimension of sensitivity to change. It has been determined that teachers between the ages of 26-30 ($\bar{X}$ = 3.190) report less positive opinions about school principals' sensitivity to change than teachers between the ages of 31-35 ($\bar{X}$ = 3.381). It has been determined that this result is in favor of teachers between the ages of 31-35. In the in-school communication dimension, it was observed that there was a statistically significant difference ($p = <0.05$) between opinions of teachers in the 31-35 age group and teachers in the other age group. Considering the average scores of these groups, it can be said that teachers between the ages of 31-35 ($\bar{X}$ = 3.222) report less positive opinion than teachers in the other age group. These results were found to be in favor of teachers aged 26-30, 36-40 and 41-45, 46-50 and over 50. In the leadership dimension, it was observed that there is a statistically significant difference ($p = <0.05$) between the 26-30 age group teachers and the 31-35 age group teachers. Considering the averages of these two groups, it was determined that teachers whose ages were between the ages of 26-30 ($\bar{X}$ = 3.166) reported less positive opinions on the leadership characteristics of school principals than teachers who were between 31-35 years ($\bar{X}$ = 3.222). These results were found to be in favor of teachers aged 36-40, 41-45, 46-50, and over 50.

According to the educational status of the teachers participating in the research, no statistically significant difference could be determined between the views of school principals on innovation competencies in terms of sensitivity to change, in-school communication and dimensions. A statistically significant difference was found in out-of-school communication ($p<0.05$), leadership ($p<0.05$) and motivation ($p<0.05$) dimensions. Considering the average scores of undergraduate ($\bar{X}$ = 3.4298) and postgraduate ($\bar{X}$ = 3.6471) in the out-of-school communication dimension, it can be said that teachers with a master's degree are of the opinion that school principals have more out-of-school communication characteristics compared to teachers with graduate degrees. Considering the average scores of undergraduate ($\bar{X}$ = 3.4605) and master's ($\bar{X}$ = 3.7647) in the leadership dimension, it can be said that graduate teachers think that school principals have more leadership qualities than graduate teachers. Considering the average scores of undergraduate ($\bar{X}$ = 3.5702) and graduate ($\bar{X}$ = 3.8431) in the motivation dimension, it can be said that teachers with a master's degree are of the opinion that school principals are more sensitive to motivation than teachers with undergraduate degrees.

According to the branches of the teachers participating in the study, no statistically significant difference was found between the views of school principals on innovation competencies in terms of sensitivity to change, in-school communication, out-of-school communication, leadership, and motivation.

According to the professional seniority of the teachers participating in the study between the views of school principals on innovation competencies, no statistically significant difference was found in terms of sensitivity, in-school communication, out-of-school communication, leadership and motivation dimensions.

According to the incumbency of the teachers in their schools participating in the study no statistically significant difference could be determined between the

views of school principals on innovation competencies in terms of sensitivity to change, in-school communication, out-of-school communication, motivation and leadership dimensions.

The results obtained from the analysis of the opinions of Vocational and Technical Anatolian High School teachers, which are the 4th sub-objective of the study, on the innovation levels of the schools are as presented.

Considering the average values of the answers given by the teachers participating in the study regarding the innovation levels of the schools, innovative atmosphere was $\bar{X}$ = 3.6818; administrative support was $\bar{X}$ = 3.6468; and organizational barriers was $\bar{X}$ = 3.0485. According to this, the teachers stated that the schools have the most innovative atmosphere managerial support feature and the least organizational barriers regarding the innovation levels of the schools. According to the opinions of the teachers working in the Vocational and Technical Anatolian High Schools, it was seen that the schools had an innovative atmosphere, administrative support and organizational barriers, respectively.

As regards answers to the items belonging to the innovative atmosphere dimension given by the teachers participating in the research, the item with the highest average was the one stating that everyone's opinions are respected; the lowest average was the item indicating the existence of a climate that encourages creativity.

The item with the highest average according to the answers to the items of the administrative support dimension given by the teachers participating in the research was the item expressing that teamwork is supported to ensure innovation while the item with the lowest average was the one that everyone is willing to innovate.

According to the answers given by the teachers participating in the research on items belonging to the organizational barrier dimension, the item with the highest average was the one that states that item innovation is not a basic organizational goal; the item with the lowest average was the item stating that school members were afraid of taking risks.

The results obtained from the findings to determine whether there is a significant relationship between the innovation competencies of the Vocational and Technical Anatolian High School principals and the innovation levels of the schools are as described.

According to the views of the teachers participating in the study, which was made to determine the relationship between the innovation competencies of the school principals and the innovation levels of the schools, the innovation competencies of the school principals and the innovation levels of the schools ($r = 0.578$, $p < 0.01$), it has been determined that there is a moderately positive and significant relationship according to the Pearson Moments Coefficients Analysis technique. In line with these results, it can be said that as the innovation competencies of school preservatives increase, the innovation levels of the schools also increase.

RECOMMENDATIONS

Here, suggestions are outlined for application by practitioners and for researchers according to the research findings. In addition, while considering the suggestions, the limitations of the study should not be ignored.

Applications for practitoners

It has been determined that compared to female teachers, male teachers have more positive opinions about the dimension of sensitivity to change from innovation competence of school principals. School principals can clearly and understandably express that they are sensitive to change, that they support change and innovation, that they give employees the opportunity to present their talents in the process of change, that they support cooperation, that decisions and practices in the change process are consistent and ethical, and at an equal distance to all stakeholders (Buyruk, 2018).

It has been concluded that teachers between the ages of 26-30 and 31-35 years have less positive views on the dimensions of sensitivity to change, in-school communication and leadership. The reason for the difference between age groups may be due to the increase or decrease in the awareness levels of teachers caused by the change in age ranges. In order to change teachers' negative opinions about these dimensions, activities and trainings can be organized in which school staff will be included to improve their in-school communication and leadership competencies. In relation to leadership dimension, principals can exhibit leadership behaviors in a way that includes teachers of all age groups. In addition, trainings can be organized for teachers of all age groups to increase the awareness of school administrators about leadership and effective communication skills that they should have in line with the needs of the age (MEB, 2018).

It was determined that the teachers participating in the study gave the lowest score to the school administrators' out-of-school communication dimension. To improve out-of-school communication, parent-teacher association activities, advisory boards, cultural activities and media can be used as tools to help. To improve out-of-school communication, school-family and environment communication should be carried out in a balanced way. To do this, parent-teacher-student meetings with joint participation can be organized. Families can be included in the process in order to provide family support to social and cultural activities in the school. To improve communication with the external environment, attempt can be made to increase motivation of the students for

the future by contacting well-known people who have graduated from the relevant school types and succeeded in life (Aslan and Kesik, 2016).

Especially for students in vocational high schools, school administrations can provide opportunities to students to get to know the institutions and to receive more applied education in the institutions by providing the necessary communication with the institutions and organizations where students can improve their professional competencies.

When considered in the context of vocational and technical education, certified education which is planned to be implemented for individuals and graduates of vocational education within the framework of the 2023 Education Vision, ensuring the acquisition of courses that are nano-credited and accredited by industry and academia collectively, organizing curriculum in accordance with the digital transformation alongside qualities that the industry demands, reviewing workshop and laboratory equipment in line with updated curriculum and needs, planned practices in relation to working fund, school administrators who are expected to initiate innovation studies for the changing needs of the society may be provided with professional training so as to implement current activity plans like transition from secondary education to relevant higher education fields and on-the-job training.

Recommendations for researchers

Similar studies examining the relationship between innovation competencies of school principals and innovation levels of schools can be carried out with different samples.

Studies can be conducted to determine the reasons of the dimensions that have significant differences between themselves statistically according to the results of the research.

Similar to this study which examined teachers' views on innovation competencies of school principals, studies can be conducted to investigate teachers' own opinions and competencies on innovation.

Education is a process that takes place in the triangle of student, teacher and school; therefore, it would not be wrong to say that all stakeholders of education will be affected by the changes and developments created by innovations. In this respect, the innovation level of schools can be detailed within the framework of these stakeholders in the following studies.

Unlike this study that was conducted in quantitative model to examine the effects of innovation competencies of school principals in Turkey as well as the innovation levels of the schools, qualitative or mixed design studies can be conducted to obtain new indepth data.

Findings of the studies conducted in the literature and research findings in relation to the innovation competencies of school principals and the innovation levels of the schools are not consistent in terms of some variables. More research can be done on populations and samples with similar characteristics to reach a consensus on this issue.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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