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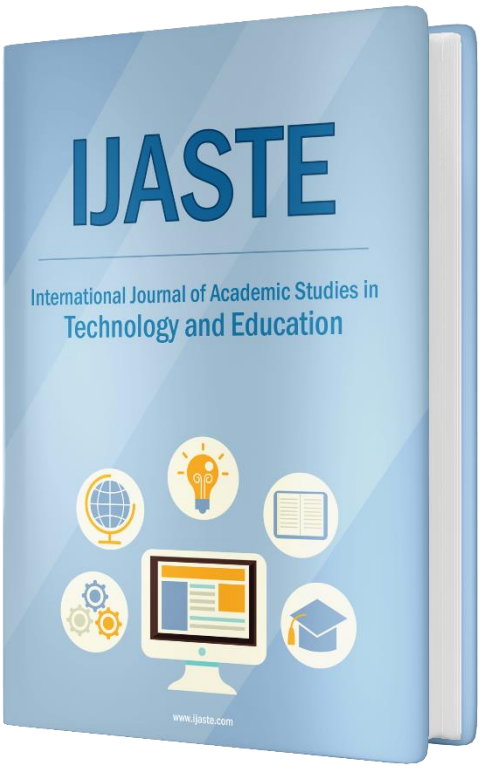

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Contact Info

International Journal of Academic Studies in Technology and Education (IJASTE)

Email: ijasteoffice@gmail.com

Web: http://www.ijaste.com

Table of Contents

Examining the School Context Predictors of Self-Determination: The Influence of Teachers' Beliefs and the Perceived Opportunities
Mihaela Cristea 1

Examining the Relationship Between Teachers' Patience Levels and Professional Resilience
Özge Erduran, Semih Çayak 22

Brushstrokes of Thoughts and Perceptions in Science Learning
Christopher Dignam 40

Stakeholders' Perceptions on Adoption of Blended Learning Approach in Tanzanian Secondary Schools
Haruni Machumu, Tusekilege Mwamkinga, Abdallah Jacob Seni 58

Clarifying the Mediation Role of Social Media Addiction in the Association between COVID-19 Risk Perception and Mental Well-Being among General Population in Türkiye
Neslihan Çıkrıkçı, Özkan Çıkrıkçı 84

IJASTE | International Journal of Academic Studies in Technology and Education

Year 2024, Vol. 2, No. 1, Pages 1-21 www.ijaste.com

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Examining the School Context Predictors of Self-Determination: The Influence of Teachers' Beliefs and the Perceived Opportunities

Mihaela Cristea

Alexandru Ioan Cuza University of Iasi, Romania

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Abstract

Background: In the literature, ecological factors of the school context and educational environment are considered opportunities for triggering self-determining behaviors. In the causal relationship between opportunities and the initiating of self-determining actions and attitudes, a key role is played by teachers' beliefs about their role in teaching self-determining behaviors and skills and how they perceive the learning and expression of students with disabilities' self-determination. Methods: The purpose of the present study is to investigate the patterns of the relationships, in terms of direct, indirect effects, and total effects, among teachers' beliefs about their role in teaching self-determination to students with disabilities, teachers' perceived opportunities in the school context and the family environment, and students' capacity for self-determination perceived by teachers. A preliminary adapted AIR Self-Determination Scale, educator form, and teachers' beliefs survey were administered to a number of 157 Romanian teachers qualified to work in the special education system, and who provide specialized educational support and therapeutic services to students with disabilities. Results: The two factors of teachers' beliefs showed direct effects on the opportunities and capacity for self-determination perceived by teachers. The opportunities for self-determination at school and home mediated the relationship between teachers' beliefs and the student's capacity for self-determination perceived by teachers. Conclusion: The study findings contribute to current Romanian research in this field, and practical educational implications were discussed.

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Corresponding Author: Mihaela Cristea, mihaela.cristea.uaic@gmail.com

Introduction

A critical indicator of how students with disabilities experience success in different social, school, and community contexts is the degree to which they activate the guiding force of their lives. (Agran et al., 2000; Wehmeyer, 2014). This process of activating resources to guide efforts and human activities toward reaching a specific goal is related to self-determined abilities, actions, attitudes, and behaviors. Students with disabilities can face numerous environmental and contextual challenges during the transition to independent adult life. These challenges and social factors can influence the transition from secondary to post-school life, enrollment in university programs, or inclusion in socio-professional and vocational communities. In this framework, several studies emphasized the importance of activating skills and actions related to self-determination, such as making choices, decision-making, setting goals and plans, problem-solving, self-advocacy, and auto-management knowledge and competencies (Mazzotti et al. 2018; Morningstar et al. 2015; Wehmeyer, 2020).

The researchers agreed that personal factors (disability labels, age, gender), and environmental factors can potentially impact the self-determination of students with disabilities (Shogren et al., 2007; Vicente et al, 2019). The functional theory of self-determination (Wehmeyer and Garner, 2003) suggests that environmental and personal characteristics enhance self-determination. According to the functional theory developed by Wehmeyer (2003), it was stated that (1) individual *capacity* is influenced by learning and development, (2) *opportunities* are influenced by the environment and experiences, and (3) *supports* and *accommodations* all impact the emergence of self-determination. The research carried out under the Causal Agency Theory led to a deeper understanding of the development and applicability of the self-determination construct by reconceptualizing the components from the perspective of positive psychology. Causal Agency Theory defines self-determination "as a dispositional characteristic manifested as acting as the causal agent in one's life" (Shogren et al., 2015, p.257). According to this theory, self-determination should be understood as a tendency to act in a specific way that reflects a person's ability to evaluate a situation and act accordingly. This personal tendency to act must be shaped by contextual and environmental factors, as well as by variables within individuals (Shogren et al., 2017). Consequently, self-determination should not be understood in an isolated manner, but rather self-determination should be interpreted according to the contexts or environments that could influence the actions, attitudes, and behaviors of the individuals. The opportunities provided by these social, community, and school environments or educational contexts can act as facilitators or barriers to self-determined actions (Mumbardó-Adam et al., 2020; Shogren, 2013). Teaching people self-determination-related skills and providing them with opportunities to act in this way in the contexts where they live (e.g., home, school job places, and community) are helpful strategies but still not enough sustainable ones (Vicente et al., 2020). Considering the major role of self-determination skills and behaviors, as well as their promotion, it is vital to investigate the impact of personal and contextual school factors on self-determination development.

These personal and contextual variables are likely to serve as predicting, moderating, and mediating variables influencing the effect of self-determination and, as such, must be considered in the design and implementation of specific interventions (Vicente et al., 2020)0.

Contextual school factors are defined as those variables that come from the school environment that can act as facilitators or barriers in specific self-determination activities and that can affect, to different degrees, the level of development of self-determination of students with disabilities. According to the ecological theory of Bronfenbrenner (1979), school factors, as well as community environment, are part of the category of mesosystem factors, with major influences on the development and evolution of individuals. Several factors associated with the school context have been identified in the literature as facilitators or barriers to self-determination (Shogren, 2013). These variables from the school context that can be catalysts or barriers in the development of self-determination of students with disabilities are teacher characteristics. The self-determination phenotype of teachers includes teachers' beliefs about their role in teaching skills associated with self-determination, school program characteristics, the way they perceive the opportunities for self-determination, and how they perceive the students' capacity for self-determination.

The Influence of Teachers' Beliefs

The teacher's beliefs about their role in teaching self-determination skills to students with disabilities are closely related to the personal system of beliefs about his or her talent and abilities in teaching students to be more self-determined in their actions and attitudes. The study of teachers' beliefs forms part of the process of understanding how teachers conceptualize their work. Constructivist theories of teacher development see the construction of personal theories of teaching as a central task for teachers (Richards et al., 2001). Researchers agreed that teacher beliefs influence teaching practice and impact students' educational experiences (Beach, 1994; Stanovich & Jordan, 1998; Wiebe, 2006). For most teachers, beliefs are formed early, remain highly durable, and acquire emotional dimensions (Pajares, 1992). Furthermore, in this sense, teachers' beliefs strongly affect how teachers design their lessons, and how they choose adequate materials and activities for the classroom (Hampton,1994). Beliefs about the role of the teacher's activity are related to other individual characteristics of the teachers, such as the graduated university programs, training programs in the field of teaching self-determination, the length of time they have been active as a teacher, the fact to teach in more or less restrictive educational environments (Grigal et al., 2003; Wehmeyer et al., 2000). In the domain of self-determination teaching and learning, researchers have identified a lack of pre-and in-service teacher training (Mason et al., 2004; Wehmeyer et al., 2000) as well as competing demands for instructional time (Eisenman and Chamberlin, 2001) as major factors that impact the capacity of teachers to teach self-determination skills as well as the opportunities, they create for students to apply these skills. Considering these benchmarks

regarding the relevance of the teacher's beliefs about his or her role activity to succeed in teaching students with disabilities knowledge, skills, and attitudes associated with self-determination, it is essential to analyze the effects, in terms of direct and indirect effect, and patterns of the relationships between the teachers' beliefs and the perceived students' capacity for self-determination.

Is it relevant how teachers perceive the opportunities and students' capacity for self-determination?

The degree to which students with disabilities have opportunities to demonstrate their self-determination skills is as important as the ability to create for them opportunities for learning behaviors and specific self-determination skills. Likewise, the opportunities provided by the family and the community are critical in learning and practicing self-determining behaviors by children and young people with disabilities. Researchers have shown that opportunities are defined in terms of the student's chances to use an accumulation of his or her perceptions, knowledge, and abilities, in other words, *capacity for self-determination*. Regarding students' capacity, studies proved that this is not enough to make students more self-determined, but it is necessary to generate and create opportunities for these capacities to be expressed and manifested (Wolman et al., 1994). Research has shown that particular factors significantly influence students in the school environment, and these factors are related to the colleagues, teachers, and professionals that they interact with every day. Therefore, peers and educators play a critical role that providing opportunities in school to promote and support students with disabilities to become more self-determined in their actions (Mithaug and Mithaug, 2002). Related to teachers' abilities to create opportunities for learning self-determined behaviors at school, research has shown that teachers who are familiar with the construct of self-determination tend to support students in becoming more self-determined, by including in their educational activities, sequences of learning of self-determined actions, attitudes, behaviors, and skills. Likewise, students are more likely to develop these skills if they are given opportunities to learn and apply them. Furthermore, the implementation of instruction to promote leadership, auto-management, and self-advocacy for students in different school activities has been shown to increase student self-determination (Grigal et al., 2003; Wehmeyer et al., 2011). Furhermore, numerous studies' findings supported the implementation of evidence-based practice programs that promote learning of self-determined behaviors in schools is a benefit for young people with disabilities (Mazzotti et al., 2022; Test et al., 2009; Wehmeyer et al., 2012). Regarding the role played by school environment factors in improving the skills associated with self-determination, the results of several studies indicated that provided opportunities both at school and at home supported students with disabilities to engage in self-determined actions (Carter et al., 2009; Cavendish, 2016; Pierson et al., 2008; Shogren et al., 2007).

To provide educational support in learning self-determination behaviors, teachers must consider in their teaching activities the opportunities from the school environment as well as the opportunities from the family

environment. The intensity of the support given by teachers to students may be influenced by how teachers perceive potentially triggering factors or opportunities from the educational and family environment related to students' capacity for self-determination.

The conceptual model and the purpose of the present study

Enhancing the self-determination of students with disabilities should be a critical objective of the educational and therapeutic programs implemented by teachers in school contexts and educational environments. Beyond the application of educational programs aimed to improve the self-determined behaviors of students with disabilities, we consider it necessary to investigate the factors of the educational context and school environments that can influence the development of self-determined behaviors and skills in children and young people with disabilities. The main research goal takes into consideration the assumption supported in the self-determination literature that creating opportunities for learning and expression of self-determined behaviors is essential. The purpose of the present study is to investigate the dynamics and types of relationships, in terms of direct, conditional indirect effects, and total effects, among teachers' beliefs, opportunities perceived by teachers in the school context and the family environment, and students' capacity for self-determination perceived by teachers. The first goal of the study was to examine the relationship between teachers' beliefs about their teaching role and the perceived students' capacity for self-determination. The second goal of this study was to explore how the opportunities generated in the school context and at home influence perceived by teachers mediate the relationship between teachers' beliefs and the perceived students' capacity for self-determination. The investigation model for this research is illustrated in Figure 1.

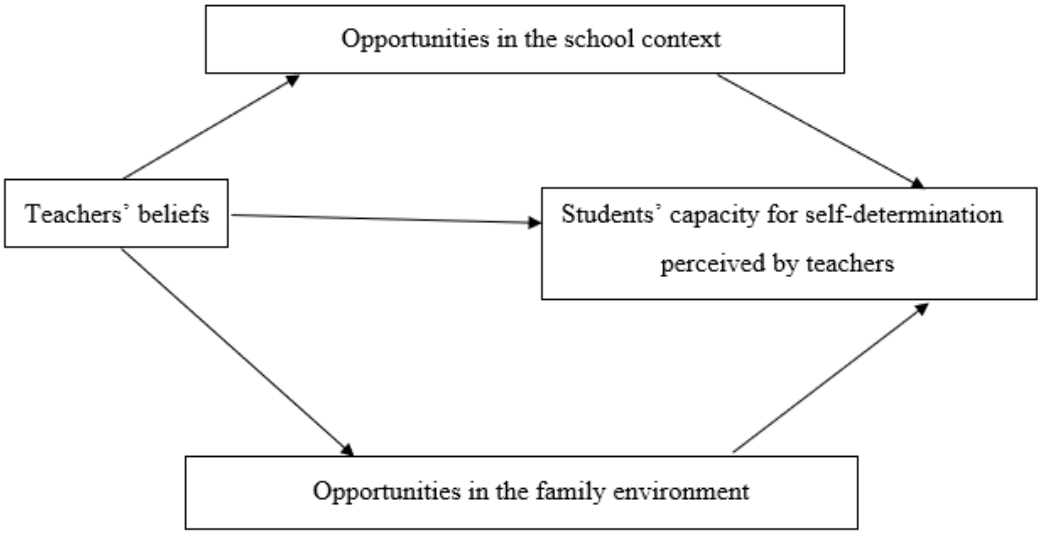

Figure 1. Research model

The research questions of the study are the following:

Research Question 1: Do the teachers' beliefs have any effects on the perceived students' capacity for self-determination?

Research question 2: Do the opportunities for self-determination perceived by teachers in the school context and family environment influence the relationship between teachers' beliefs and the students' capacities for self-determination perceived by teachers?

Method

The present study was based on a convenience sampling method, a total of 157 teachers working in the Romanian special education system, respectively in special schools in the city of Bucharest, Iași, and Vaslui participated in this study. The participating teachers in the study provided educational support and services to students with learning difficulties, mild, moderate, severe, and profound intellectual disabilities, developmental disorders, autism spectrum disorders, and hearing impairments. Regarding academic training programs and specialization, although all study participants work in the Romanian special education system, they have different statuses and professional, and didactic roles. Thus, the group of participants was made up of special education teachers (32,70 %), learning support teachers (30.90 %), teachers for complex and integrated therapeutic activities (18.20 %), itinerant and support teachers (10, 90 %), teachers who teach other subjects, such as physical education, arts, technological and vocational education (7.30 %). Regarding the degree programs completed, most participants are graduates of master's university programs in Special Education (57.50 %), bachelor's programs in the Special Education field (36.50 %), and graduates of doctoral academic programs in Education Sciences (5.50 %). Related to seniority in the educational system, 40.50% of the teachers worked in the educational system, providing educational support and services to students with disabilities and support needs. Regarding gender, most of the participants (141) in the study were female (90%). The distribution according to age showed that most participants were between 45-55 years old (44.50%). **Table 1** shows the socio-demographic and professional characteristics of the teachers participating in the present study.

Table 1. Participants' Sociodemographic and Professional Characteristics

Teachers' Characteristics	**Number**	**Percentage**
Special education teachers	51	32.70 %
Learning support teachers	48	30.90 %
Teachers for complex and integrated therapeutic activities	29	18.20 %
Itinerant and support teachers	17	10. 90 %
Teachers who teach other subjects	12	7.30 %
Completed academics programs		

Bachelor's programs in the Special Education	58	36.50 %
Master's University programs in Special Education	90	57.50 %
Doctoral Academic programs	9	5.50 %
Seniority in teaching		
25 to 35 years	42	26.50 %
15 to 25 years	64	40.50%
5 to 15 years	40	25.50 %
5 years or less	11	7.50 %
Distribution according to chronological age		
45-55 years	70	44.50%
35-45 years	46	29 %
25-35 years	33	21.30 %
under 25	8	5%
Gender		
Female	141	90%
Male	16	10%

Measures

The measurement tools for this research were the AIR Self-Determination Scale, the educator form, and a culturally adapted scales to measure the dimensions of teachers' beliefs and convictions related to teaching self-determination to students with disabilities (Grigal et al., 2003).

AIR Self-Determination Scale: The Educator Form

The AIR Self-Determination Scale, based on the self-determination learning theory was developed by the American Institute of Research (Wolman et al.,1994; Mithaug et al., 2003) to assess and develop strategies for enhancing participants' level of self-determination. Technically, the AIR Self-determination Scale, the educator form used in this research is a 30-item, 5- 5-point Likert scale, comprising the *Capacity* and the *Opportunities* domains. *The Capacity* domain is composed of three sub-dimensions (sub-scales): *Knowledge*, *Abilities*, and *Perceptions*. *The Opportunities* domain is composed of two sub-domains (sub-scales)*:* Opportunities at School and Opportunities at Home. *The Knowledge* sub-scale contained 6 items built on assumption that the knowledge is a cognitive process that, in this framework, reflects the person's level of understanding of actions and attitudes related to self-determination. More specifically, knowledge refers to identifying needs, interests, limits, and how to make choices, set goals, and plan actions. The *Ability sub-scale* (6 items) reflected the connection between knowledge and performance obtained by applying them in situations that involve a self-determined behavior of the person. *The Perception sub-scale* (6 items) is based on enhancing

the student's sense of self, including self-confidence, self-esteem, and a sense of freedom to meet interests and needs. *The Opportunities at Home* and *Opportunities at School* sub-scales are composed of 6 items each, and they are based on the statement that opportunities are triggering frameworks that offer or in which capacities are expressed and exercised (Wolman et al., 1994; Mithaug et al., 2003). The AIR Self-Determination Scale has shown good results on various reliability tests (the alternative-item test, ranging from 0.91 to 0.98; the split-half test, 0.95; and the test–retest, 0.74; Wolman et al. 1994). The AIR Self-Determination Scale has been used extensively around the world, especially in North America and Europe, and the scale is available in English, Spanish, French, Norwegian, and Chinese language (Wong et al., 2016; Garrels and Granlund, 2018).

For this study, we used the educator version of the AIR Self-Determination Scale. To adapt this instrument to measure the self-determination levels of students with disabilities from the perspective of Romanian educators and teachers who work with students with disabilities, we conducted a pilot study to highlight the preliminary psychometric properties of this adapted scale. In the first stage, 30 items of *Capacity* and *Opportunity* domains were translated and adapted into the Romanian language by following the guidelines for the adaptation of self-report measures concerning linguistic, semantic, cultural, and conceptual equivalence proposed by the International Test Commission (Hernández et al., 2020).

We ran an exploratory factor analysis to examine the sub-scales of the AIR Self-Determination Scale. Descriptive statistics indicated a normal distribution of the items, as the data was nearly symmetrically distributed. Skewness values are situated in - 2.03 to .93 intervals and kurtosis values are slightly negative, most of them were near 0. The correlation matrix shows the pairwise correlations, with significant correlations ($p < .001$) among the 30 items. The determinant of the *R*-matrix suggested the absence of multicollinearity. The Kaiser-Meyer-Olkin measure of sampling adequacy coefficient was .76. Bartlett's test of sphericity showed an approximative chi-square of 4460.74 at degrees of freedom of 435, and a significant $p < .001$, and these results indicate a good relationship between the variables. The communalities values were 1 for all 30 items, and after extraction, the items had communalities, scores ranging from .56 and .86, these indicated the percent of variability explainable by the factors. Using the criterion of selecting eigenvalues over 1, the total variance explained that 5 components out of 30 have been produced with eigenvalues greater than 1. These 5 factors can explain 75,00 % of the variance in the data. The factors resulting from the exploratory factor analysis are equivalent to the subdomains of the scale: Knowledge, Ability, Perception, Opportunities at School, and Opportunities at Home.

The reliability analysis study of the AIR Self-Determination Scale administered to Romanian teachers demonstrated very good internal consistency, with *Cronbach's alpha* coefficient for the whole scale having the value of .93. For the Capacity domain with the sub-scales – Knowledge, Ability, and Perception the *Cronbach's alpha* coefficient was .90; .86; and .87. For the Opportunity domains comprising the Opportunity at School and Opportunity at home sub-scales the *Cronbach's alpha* coefficient was: .90, respectively, .92.

Teachers' Beliefs Measurement

For this study, a survey was built to measure teachers' beliefs and convictions regarding the role of their activity in teaching self-determined behaviors and abilities to students with disabilities. A systematic review of the literature on this topic indicated that two assumptions about teachers' beliefs could be formulated. First, it was mentioned that teachers generate and create at-school opportunities for learning self-determination. The second assumption indicates that teachers need to be trained in using specific intervention strategies and programs to teach self-determination behaviors and skills to the students. Starting from these two statements, we adapted a scale that operationalized the construct of teachers' beliefs. In the construction of this instrument were included 10 self-reporting items with answers reported to a 5-point Likert scale from *strongly agree* to *strongly disagree*. In the scale construction, two dimensions of teachers' beliefs about their role activity in teaching self-determination were taken into consideration: student opportunity to learn and practice self-determination skills and teacher familiarity with self-determination (Grigal et al., 2003). The elaboration of the 10 items was followed by an exploratory factor analysis. The pattern matrix indicated the factor loadings onto two factors, and the variances explained for each component were ranging from .59 to .83. These 2 factors can explain 64.13 % of the variance in the data. Factor 1 named *Teachers' Beliefs 1*, corresponds to individual and personal characteristics of teachers to teach self-determination, and factor 2, *Teachers' Beliefs 2* was equivalent to the skills acquired by teachers during self-determination training programs. The scale proved very good reliability, *Cronbach's alpha* coefficient for this scale was .84.

Procedures

This study adopted a self-reporting measure method and was attended by teachers which provides educational support and services in special schools, regular schools, and vocational high schools. The present study was attended by teachers from the city of Bucharest and the counties of Iasi and Vaslui, Romania.

In the first phase, we contacted the directors of the institutions participating in the research, who expressed their agreement regarding institutional participation in this study, then the teachers who wanted to participate in the study were asked to express their agreement to participate in this research. Informed written consent was sought from each participant before the assessment scales administration process began. Before starting the administration process of the assessment tools, participants were assured that their privacy, confidentiality, and anonymity would be protected. All participants were fully informed of their autonomy and voluntary responses in the interview process and were told they could withdraw at any time.

In the second phase, the AIR Self-Determination Scale and Teachers' Beliefs survey were sent to participating teachers via e-mail or posted by school administrators on the schools' communication platform. The obtained data entered the analysis process following the purpose of the study. The Research Ethics Committee approved this research.

Data Analysis

Statistical analyses were performed with IBM SPSS Statistics, version 29 for descriptive statistics and exploratory factorial analyses. The structural equation modeling (SEM) approach provided by IBM SPSS AMOS 29 Graphics was used to conduct a path analysis for the estimation of direct and total effects. The indirect effects were analyzed within the multiple analyses of the parallel mediation model (Model 4) through PROCESS Macro for SPSS version 4.0 (Hayes, 2021).

Results

Normality Assessment: Descriptive Statistics and Correlations

The means, standard deviations, skewness, kurtosis values, and correlations among variables are displayed in Table 2. The Pearson correlations among study variables were positive and most of them were statistically significant.

Table 2. Descriptive Statistics and Correlations

Variables	Mean	s.d.	Skewness	Kurtosis	1	2	3	4	5	6	7
1. Knowledge	13.01	4.53	.79	.35	1						
2. Abilities	14.49	4.78	.56	.05	.74**	1					
3. Perceptions	15.82	5.17	.67	-.26	.60**	.80**	1				
4. Opportunities at School	23.03	4.56	-.55	-.16	.07	.16*	.25**	1			
5. Opportunities at Home	17.76	5.41	.00	-.79	.24**	.47**	.42**	.34**	1		
6. Teachers' Beliefs 1	11.87	2.63	-.65	-.57	.13	.23**	.25**	.25**	.29**	1	
7. Teachers' Beliefs 2	28.65	4.46	-.63	.21	.17*	.19*	.27**	.40**	.16*	.42**	1

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

*. Correlation is significant at the 0.05 level (2-tailed).

Estimation of Direct Effects and Total Effects

A causal path model was generated to estimate the direct and total effects of the conceptual constructs of the study. The model was composed of five observable endogenous variables – Opportunities at School, Opportunities at Home, Abilities, Perceptions, and Knowledge, and two observed, exogenous variables: Teachers' Beliefs 1 and Teachers' Beliefs 2. In the model are included five unobserved, exogenous variables. Figure 2 illustrates the path causal model with unstandardized estimates. The causal path model has been estimated with several goodness-of-fit indices: *p*-value for the model was significant ($p = .00$), *chi-square* = 13.77, $df = 3$, *GFI* = .97, *CFI* = .97, *SRMR* = .05. Reported to Hu and Bentler's parameters (1999), the estimation model indicated an acceptable fit for the model.

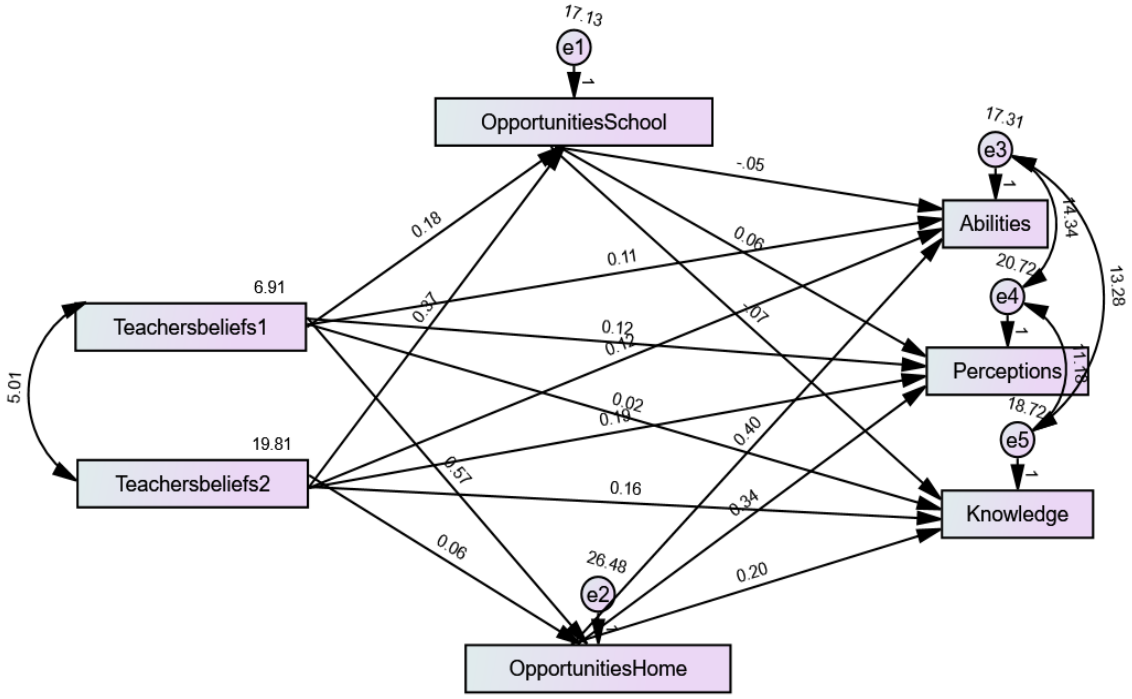

Figure 2. Path Causal Model

The results showed that several direct effects are identified in the patterns of the relationships between the variables of the path causal model. Thus, the factor Teacher's Beliefs 1 had a direct effect on opportunities at school perceived by teachers, (β = .25, p = .00), and a direct effect on opportunities at home perceived by teachers (β = .30, p = .00). The findings indicated that the factor Teachers' Beliefs 2 had a direct effect on opportunities at school perceived by teachers (β = .35, p = .00), had a direct effect on abilities (β = .19, p =. 05), perceptions (β = 17, p = .04), knowledge (β = .20, p = .05). Furthermore, opportunities at home perceived by teachers had a direct effect on abilities (β = .45, p = .00), perceptions (β = .36, p = .00), and knowledge (β = .24, p = .00). Table 3 indicates the unstandardized and standardized regression weights coefficients; the statistically significant parameters could explain the magnitude of the direct effects manifested between the variables of the model.

Table 3. Estimates Coefficients for Unstandardized and Standardized Regression Weights

Variables			**Unstandardized Regression Weights Estimate**	**p-value**	**Standardized Regression Weights Estimate (Beta coefficients)**
Opportunities at School	←	Teachers' Beliefs 1	.17	.00	.25
Opportunities at School	←	Teachers' Beliefs 2	.36	.00	.35
Opportunities at Home	←	Teachers' Beliefs 1	.56	.00	.30
Opportunities at Home	←	Teachers' Beliefs 2	.05	.57	.05
Abilities	←	Teachers' Beliefs1	.11	.44	.06
Perceptions	←	Teachers' Beliefs 1	.12	.46	.06

Knowledge	←	Teachers' Beliefs 1	.02	.91	.01
Abilities	←	Opportunities at School	-.04	.54	-.04
Perceptions	←	Opportunities at School	.06	.52	.05
Knowledge	←	Opportunities at School	-.07	.40	-.07
Abilities	←	Teachers' Beliefs 2	.12	.05	.19
Perceptions	←	Teacher's Beliefs 2	.20	.04	.17
Knowledge	←	Teacher's Beliefs 2	.16	.05	.20
Abilities	←	Opportunities at Home	.40	.00	.45
Perceptions	←	Opportunities at Home	.34	.00	.36
Knowledge	←	Opportunities at Home	.20	.00	.24

The total effects estimated within the causal path model are considered a sum of the direct and indirect effects manifested between the variables of the model. The results showed that the total effect of Teachers' Beliefs 1 on opportunities at home perceived by teachers was .27, on opportunities at school perceived by teachers the total effect had a value of .36, the total effect on knowledge was .27, on perceptions .16, and on abilities was .38. The factor Teachers' Beliefs 2 manifested total effects on the other variables of the path model with different magnitudes. The effect on teachers' perceived opportunities at home was identified at .05, on teachers' perceived opportunities at school the value of the total effect was .36, on knowledge at .25, perception at .24, and the total effect on abilities was .31. Table 4 depicted the standardized values of the total effects as they were distributed among the variables of the causal path model.

Table 4. Standardized Total Effects

	Teachers' Beliefs 2	**Teachers' Beliefs 1**	**Opportunities at Home**	**Opportunities at School**
Opportunities at Home	.05	.27	.00	.00
Opportunities at School	.36	.36	.00	.00
Knowledge	.25	.27	.24	-.07
Perceptions	.24	.16	.36	.05
Abilities	.31	.38	.45	-.05

Mediating Effects (Indirect Effects)

For isolating the mediation effect of a variable on the relationship between the other two variables we used in the data analyses model 4 from the Process Macro (Hayes, 2021), and the results were obtained through multiple successive analyses of mediation models. In the mediation analyses with teachers 'perceived opportunities at school as a mediator, the outcomes showed in the first model with the model summary indicated R = .53, R^2 = .28, F = 30.96, and p = .00, the opportunities at school perceived by teachers mediated the relationship between the factor Teachers' Beliefs 1, related to teachers individual and personal

characteristics, and students' capacity for self-determination perceived by teachers (β = .77, *BootSE* = .25, *BootLLCI* = .32, *BootULCI* = 1.30, with 0 not included, and 95% level of confidence interval). In the second analysis model, the findings indicated a model summary with R = .32, R^2 = .16, F = 18.54, and p = .00, the relationship between factor Teachers' Beliefs 2, related to teaching skills acquisition, and students' capacity for self-determination were mediated by opportunities at school perceived by teachers, the indirect effect was explained in the model, β = .70, *BootSE* = .16, *BootLLCI* = .41, *BootULCI* = 1.07, with no 0 included, at 95% level of confidence.

In the mediation analyses with opportunities at home perceived by teachers as a mediator, in the first model analyzed, the model summary showed R = .70. R^2 = 50, F = 77.76, and p = .00, we found that in the relationship between Teachers' Beliefs 1 and students' capacity for self-determination, opportunities at home perceived by teachers had a mediating effect, β = 1.33, *BootSE* = .38, *BootLLCI* = .63, *BootULCI* = 2.15, no 0 included, and 95% level of confidence. In the second model analyzed, the model summary indicated R = .73, R^2 = 53, F = 88.23, p = .00, the relationship between Teachers' Beliefs 2 and students' capacity for self-determination was mediated by opportunities at home perceived by teachers, the indirect effect was .43, *BootSE* = .20, and *BootLLCI* = .04, *BootULCI* = .86, with no 0 included, and 95% level of confidence.

Discussion and Conclusion

The purpose of this study was to investigate the patterns of the relationships between factors originating from the educational environment and the family context and the students' capacity for self-determination perceived by teachers. Our study was started on the assumption that mesosystem ecological factors, in particular, contextual school factors influence the configuration and structure, as well as the power and magnitude of the self-determining behaviors and skills of students with disabilities. In this conceptual framework, this study aimed to investigate the relationships, in terms of direct, indirect, and total effects on teachers' beliefs about their role in the activity of teaching self-determination, opportunities created at school and home perceived by the teachers, as mediators, and the students' capacity for self-determination perceived by teachers. Most of the study findings were similar and confirmed the results of the other studies found in the self-determination literature, with the main difference regarding the cultural specificity of the Romanian educational system. For a nuanced understanding and interpretation of the study findings, these will be discussed following the rationale of the research questions.

1. Do the teachers' beliefs have any effects on the perceived students' capacity for self-determination?

The study findings indicated that the teachers' beliefs, which were delimited into two factors, Teachers' Beliefs 1, related to individual and personal teachers' characteristics in teaching self-determination, and Teachers' Beliefs 2, related to skills acquired by teachers following training courses and programs in the field of teaching self-determination, manifested direct effects on students' capacity for self-determination perceived by teachers, in terms of knowledge, abilities, and perceptions. Thus, the factor Teachers' Beliefs 1, the individual and personal teachers' characteristics, had a direct effect on the opportunities that teachers created and generated

in the school environment and educational context for students in their learning process of self-determined behaviors and skills. Moreover, the factor Teachers' Beliefs 2 related to teachers' skills acquired in designed self-determination training programs, predicted the specific opportunities for learning self-determination in educational settings, classrooms, and school environments. Also, the factor Teachers' Beliefs 2 of trained teachers in self-determination programs was associated with the student's capacity for self-determination perceived by teachers, the study findings suggested a direct link between the factor Teachers' Beliefs 2 and students' knowledge, abilities, and perceptions for self-determination learning and expression. Another statistically significant result showed that the opportunities generated in the family environment predicted students' knowledge, abilities, and perception skills perceived by teachers as *Capacity*, a component of self-determination.

The Romanian teachers' beliefs regarding the process of acquiring self-determination behaviors and skills played an essential role in creating learning opportunities in the classroom, in the school settings, and the students' educational environment. The study outcomes are also supported by other findings from the literature, the other research highlighted the role of school opportunities in the success of the implementation of evidence-based practices aimed to improve self-determination in students with disabilities (Burke et al., 2020; Grigal et al., 2003; Shogren et al., 2016; Vicente et al., 2020). Other studies indicated the relevance of teachers' roles in generating learning opportunities for self-determination. Researchers found a positive relationship between opportunities at school and increasing positive school outcomes (Field and Hoffman, 2002), the improvement of prosocial behaviors (Carter et al., 2009), and the development of vocational and transition skills (Carter et al., 2006; Mazzotti and Rowe, 2015).

2. Do the opportunities for self-determination perceived by teachers in the school context and family environment influence the relationship between teachers' beliefs and the students' capacities for self-determination perceived by teachers?

Regarding the mediation analyses, the results of the first mediation model have shown that the relationship established between the teachers' beliefs based on individual and personal characteristics and students' capacity for self-determination perceived by teachers is influenced by the opportunities of the educational environment. The second analyzed mediation model indicated that the relationship between the beliefs of trained teachers to acquire skills in teaching self-determination and the improvement of self-determination of students with disabilities was influenced by the opportunities generated or created within educational environments. According to the study findings, we can suggest that Romanian teachers' beliefs about teaching self-determination, viewed through the prism of individual and personal factors, and from the perspective of being trained in the self-determination teaching field are strongly related to students' capacity for self-determination. The relationships between teachers' beliefs and perceived students' capacity for self-determination are influenced in positive ways by the opportunities given and created in the organizational school culture where the teachers work. In this particular point of view, the opportunities offered by the school context are perceived by the teachers as facilitators and catalysts in the didactic approach of students with disabilities' self-determination educational training. Similar research that analyzed the mediating role of

opportunities at school in enhancing students with disabilities' self-determination indicated results that supported and confirmed the outcomes of the present study (Shogren, 2013; Vicente et al., 2019, Wehmeyer, 2020). Researchers found that teachers' perceptions about students' opportunities to learn and practice self-determination skills at their school were also mediated by teacher position, teacher role, and teaching experience (Carter et al., 2006; Grigal et al., 2003; Vicente et al., 2019).

The mediation analyses that have as a mediator the opportunities at home perceived by teachers indicated that this predicted the students' capacities for self-determination perceived by the teachers. Thus, the study outcomes suggested that opportunities at home influence the relationship between teachers' beliefs based on their individual and personal characteristics and students' capacity for self-determination perceived by teachers. Similarly, the results indicated that the relationship between teachers' beliefs based on the teaching knowledge and skills acquired by teachers during particular self-determination training and programs, and students' capacity for self-determination perceived by teachers is mediated by the opportunities created and identified in the family environment. In other words, Romanian teachers' beliefs about students' capacity for self-determination can be explained through the lens of family factors that create opportunities at home for learning and manifesting self-determined behaviors and skills. On the other hand, researchers found discrepancies between educators and parents regarding opportunities for self-determination at school and home are particularly striking, with educators asserting that few self-determination opportunities exist for students at home and parents countering that diminished opportunities exist at school (Carter et al., 2006; Grigal et al., 2003). Researchers also suggested that the opportunities at home should complement those designed at school, by re-dimensioning and activating in a family environment a self-determination learning model that conducting to the improvement of school outcomes, as well as vocational skills related to the transition planning to independent life Mazzotti et al., 2013)

The results of the study showed that the teachers' beliefs factors have a total effect on students' self-determination capacity perceived by teachers, the total effects being a summation of the direct and mediating effects. The analysis of the causal path model showed that the magnitude of the direct effects between teachers' beliefs and students' capacity for self-determination perceived by teachers were amplified by the indirect effects of opportunities at home and opportunities generated in school that positively strengthened the direct relationships. This highlighted the crucial role of the school environment and the educational context, proven that educational factors have a full action on the development of self-determination which will be reflected in high indicators of the quality of life of students with disabilities (Mumbardó-Adam et al. 2017; Shogren et al., 2013; Wehmeyer, 2020).

Limitations

Several limitations should be considered when interpreting the results of the present study. The first limitation refers to the small number of participants in the examined group, although all categories of teachers who work and teach students with disabilities are represented in the group structure, the number was small, so the results

must be interpreted and generalized with caution. Another limitation, related to the participants, refers to the non-inclusion of the investigated group of teachers from mainstream public education, the data obtained from this category of teachers would have brought more value to the study by allowing comparative analyses between the groups of teachers who work in the field of special education and teachers who teach students in the regular schools' classes. The second limitation of the study refers to the instrument for measuring the teachers' beliefs, which in this study measured only two factors, namely the individual and personal characteristics of the teachers, and the capacities and skills to teach self-determination acquired in specific self-determination training programs. It would have added more value if other factors related to teachers' beliefs and convictions to teach students self-determination behaviors and skills were included in this assessment tool. The third limitation is related to the non-inclusion of parents in the study for considering the parents' perspective regarding the opportunities at home and school to promote self-determination. This would have added a new variable to examine, as the studies have shown that there is a lack of knowledge between parents and teachers regarding the methods of generating opportunities for self-determination learning and manifestation, this discrepancy is attributed to the lack of communication between teachers and parents in the approach of a common and coherent plan for the creation of opportunities and choices for the students (Carter et al., 2009; Shogren et al., 2013; Wehmeyer and Shogren, 2016).

Implications For Future Research and Practice

In this study, we examined the patterns of relationships between teachers' beliefs and students' capacity for self-determination perceived by teachers through the prism of the influence of the opportunities created at school and the opportunities generated in the family environment. Related to future research, although we have obtained relevant findings for the Romanian self-determination context of the research regarding the mediating role of ecological factors in the school environment, and educational context, it is recommended that in future studies the opportunities to be analyzed punctually in a direct and dynamic relationship with capacities and, to the same extent, strategies for stimulating and learning of self-determination. Another direction of research consists in the investigation of students' abilities to make choices in an individual manner of the most suitable opportunities for the development of self-determined behaviors, the ability to identify, prioritize, and choose the most appropriate opportunities being a vital objective in learning self-determination. Another direction for future studies has a pragmatic characteristic and aims to examine the relationships between opportunities created in school, in the family environment, or the community, and the development of educational strategies and therapeutic and educational programs aimed at capitalizing on those opportunities for the students' benefits. Related to the educational and therapeutic practice, it is obvious that the opportunities at school and family environments, through their role as predictors of optimizing the self-determination of students with disabilities, must be key points of educational programs aimed at teaching self-determining behaviors and skills. Many of these educational programs that are based on opportunities from the educational environment and the school context, above all, can be adapted according to the students' developmental stages. The aim of these educational programs based on self-determination opportunities must be, beyond increasing the students' abilities to express

self-determined behaviors and skills, the promoting of school outcomes, vocational skills, and capacities that will find the maximum expression in the transition period toward an independent life.

In conclusion, the results of this study are a novelty for the context of self-determination research in Romania, the investigation of the effects between the teachers' beliefs related to the role of the activity of teaching self-determination and the students' capacity to express self-determination behaviors indicated that they are influenced by the opportunities created both in the socio-school context and as well as by the opportunities generated within the family environment. This study highlighted the causal chain, the relationship of reciprocity that appears in this context, positive teachers' beliefs will direct them to create opportunities for the learning and teaching process of self-determination. Therefore, this new perspective will lead to the creation of a favorable environment for the expression and enrichment of students' self-determination behaviors, with strengthening and empowering effects on teachers' beliefs and convictions.

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Author Information

Mihaela Cristea
https://orcid.org/0000-0003-2889-9276
Alexandru Ioan Cuza University of Iasi,
Faculty of Psychology and Education Sciences,
Education Sciences Department
Sos. Museum, no.53, apt.23, Iasi, 700281, Romania

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Examining the Relationship Between Teachers' Patience Levels and Professional Resilience

Özge Erduran Tekin
National Defense University, Türkiye

Semih Çayak
Marmara University, Türkiye

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Abstract

The purpose of this research is to examine the relationship between teachers' patience levels and their professional resilience. In this research, which was designed in a relational survey model, the "Teacher Patience Scale" developed by Meriç and Erdem (2022) and the "Teacher Professional Resilience Scale" developed by Näswall, Malinen, Kuntz, and Hodliffe (2019) and adapted into Turkish by Limon (2022) were used as data collection tools. The sample of the research consists of 404 teachers working in public schools in the Kartal and Tuzla districts of Istanbul. According to the research findings, it was found that the teachers' patience levels and professional resilience levels were high. In addition, while the patience and professional resilience levels of teachers do not show a statistically significant difference according to the gender of the teachers, their educational status, and the number of teachers working in their schools, they show statistically significant differences according to their professional seniority and educational levels. These differences are in favor of teachers working in primary and secondary schools and teachers with lower seniority. According to another finding obtained from the research, there is a positive, high, and significant relationship between teachers' patience levels and their professional resilience levels. As a result of the regression analysis, it was seen that teacher patience was a significant predictor of professional resilience. Teacher patience explains 73% of professional resilience.

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Corresponding Author: Semih Çayak, semihcayak@gmail.com

Introduction

Teachers are one of the most important parts of the education process. Some personal and professional characteristics of teachers enable them to fulfill their profession successfully and to be role models for their students in the desired direction. Professional resilience and patience are some of the positive characteristics that teachers should possess. Patience is the ability to remain emotionally calm and behaviorally wait for undesirable events that people encounter in the course of life (Schnitker, 2012). Patience, a word borrowed into Turkish from Arabic, means self-restraint and self-control (Doğan, 2016). Patience is not a one-dimensional concept and can be seen both as a tendency and as a state. Individuals can be considered as patient people in general or they can show patience against some negative situations experienced in particular (Schnitker, 2012). In other words, patience is the power to endure in the face of sad situations that a person cannot change (Okçu & Pilatin, 2018).

Patience has many positive effects on mental health (Meriç & Erdem, 2022). Patience improves people's flexibility and contributes to their maturation by improving their coping skills (Esen Ateş & Kayıklık, 2019; Sharifi Saki et al., 2018). Thanks to patience, people cope with challenging life events more easily, experience less burnout, and are more successful in maintaining mental health even in the face of negative events (Ateş, 2019; Mahdiyar, Taghavi, & Goodarzi, 2016). Patience does not only refer to the power to endure difficulties, it is defined as not only enduring difficulties but also making efforts in problematic situations and not giving up despite making a lot of effort (Önal, 2008). Patience has been evaluated in the literature in two ways: short-term and long-term. While waiting for an undesirable situation to pass in the face of events experienced in daily life can be considered short-term patience, the patience shown to cope with long-term undesirable life events can be given as an example of long-term patience (Hood et al., 2009). In terms of its functionality, patience is handled in two ways active and passive, and active patience refers to exhibiting various behaviors for the solution of this situation after the acceptance of undesirable situations. In passive patience, on the other hand, there is a stagnant mental process of internalizing and tolerating the problematic situation rather than making an effort to solve it (Özdoğan, 2005). Patience is a virtue that is necessary in all areas of life and being patient in professional life is also very important and contributes positively to people's mental health (Aghababaei & Tabik, 2015; Khormaei et al., 2017). Moreover, patience is inversely related to negative emotional states such as depression and anxiety (Neff, 2003). People may encounter various negativities in their working life. In the face of unwanted experiences, it is very important that the person can manage the process by remaining calm after making all the necessary efforts (Meriç & Erdem, 2022).

As in other professions that require communication with people, patience is very important in fulfilling the profession (Efilti et al., 2021; Gültekin, 2020; Murphy et al., 2004; Üstüner et al., 2021). Teachers may

experience undesirable situations with students, parents, other teachers, or administrators while fulfilling their profession. Teachers need to approach these undesirable situations with patience (Meriç & Erdem, 2022). Therefore, it can be said that patience is one of the characteristics that enable teachers to be successful in fulfilling their profession (Gültekin, 2020). Achieving the desired success outcomes in the teaching profession requires teachers to be patient (Duman & Taş, 2021; Meriç & Erdem, 2023; Shishavan & Sadeghi, 2009). When the literature is examined, it is seen that teachers have been exposed to various negative situations in recent years with the difficulties brought by the teaching profession (Beltman & Mansfield, 2017; Fan et al., 2021). In the face of undesirable situations such as burnout and stress, it is thought that professional resilience is important for teachers to continue their duties in the desired way and to overcome negative professional experiences (Meriç & Erdem, 2023; Smith & Ulvik, 2017). Teachers' high resilience will make it easier for them to manage the crises they are exposed to in school (Botou et al., 2017).

Resilience is the ability to use coping skills against undesirable situations that occur in one's life, to be successful, and to adapt to changing differences (Oktan, 2012). Resilient individuals have several personal strengths such as certain personality traits and skills (Mansfield et al., 2012; Masten, 2001). Occupational resilience is considered a sub-dimension of psychological resilience (Çetin, 2020). When professional resilience is considered in the teaching profession, it emphasizes the teacher's effort, adaptation, and belief that he/she can successfully perform his/her profession to overcome the difficulties he/she encounters while doing his/her profession (Tagay & Demir, 2016). Resilience includes the teacher's ability to adapt to changing conditions in the face of necessary situations, to show flexibility, to recover quickly after negative experiences, and to maintain a strong structure after the change (Schelvis et al., 2014). In addition, teacher resilience is considered as a personal characteristic in the literature and can be evaluated as a skill that enables teachers to cope with challenging events (Pretsch et al., 2012).

Teachers' high professional resilience positively affects their professional performance (Maddi, 2002). High resilience enables teachers to make efforts to overcome the problems they may experience with colleagues, students, or parents, to have faith that they will be successful in overcoming problems, and to be committed to educational practices (Brunetti, 2006; Daniilidou & Platsidou, 2018). Resilient teachers strive to maintain a successful teaching environment despite all the negative situations they face (Ebersöhn, 2014). In the literature, teacher resilience is considered a multidimensional concept, and teacher resilience contributes positively to the student learning process (Limon, 2022). Studies have examined teacher resilience in various dimensions including motivational, emotional, social, professional resilience, professional success, self-efficacy perception, and optimism (Beltman, 2021; Li et al., 2019; Peixoto et al., 2020). In addition to all these, it has been seen that professional resilience can be developed in the teaching profession (Brunetti, 2006). It has been observed that teachers' having a sense of responsibility, high social skills and problem-solving skills,

professional goals, a sense of humor, a desire for success, expectations, and a high sense of competence can increase their resilience (Bobek, 2002). In another study, it was observed that the climate of the school, services, and opportunities offered to teachers increase their professional resilience (Boldrini et al., 2019). In addition, sustaining the teaching profession with a sense of commitment to a purpose, perceiving the difficulties experienced while practicing the teaching profession as a learning experience, and continuing to be in relationship with other professional shares and students by accepting unchangeable situations also increase teachers' professional resilience (Drew & Sosnowski, 2019). Considering that one of the most important indicators of resilience in the educational process is coping with difficulties encountered in the learning and teaching process and avoiding obstacles (Carr & Claxton, 2002), patience is likely to affect professional resilience.

In the literature, teacher professional resilience is associated with motivation and commitment to the profession (Ellison & Woods, 2020); burnout and stress (Daniilidou et al., 2020); teacher self-efficacy (Ellison & Woods, 2020; Razmjoo & Ayoobiyan, 2019); happiness (Altuntaş & Genç, 2020); attitude towards teaching profession (Dönmez & Karasulu Kavuncuoğlu, 2019) and professional well-being (Brouskeli et al., 2018) and significant relationships were found. It is thought that patience may be one of these personal characteristics that are examined considering that teachers may be related to professional resilience. Studies have shown that there are positive relationships between psychological resilience, which is related to resilience, and patience (Eliüşük, 2014; Khormaei et al., 2017). In a study, the relationship between teachers' patience level and burnout was examined and a negative relationship was found between patience and burnout (Meriç & Erdem, 2023). In another study, the relationship between physical education teachers' psychological resilience, patience, and happiness levels was examined, and it was found that there was a moderately significant relationship between patience and psychological resilience (Ulukan & Ulukan, 2021). On the other hand, while there are a limited number of studies examining the patience levels of teachers in the literature (Meriç & Erdem, 2022; Meriç & Erdem, 2023; Niyazibeyoğlu & Dağcı, 2023; Türkgeldi, 2019; Ulukan & Ulukan, 2021), no study addressing the relationship between patience and professional resilience of teachers was found. Considering that the personality traits that teachers should have are important for them to successfully continue their profession (Gültekin, 2020), patience can be considered as a trait that will increase teachers' professional resilience. Patience is an important life value (Norling, 2009). Knowing how patience levels are related to teachers' professional resilience can provide preparation for practices in which teachers can increase their patience levels and improve their patience characteristics to increase their professional resilience. In this context, this study aims to contribute to the literature by examining whether teachers' patience and professional resilience levels differ according to demographic variables such as gender, educational status, professional seniority, and the number of teachers in the school.

Based on these, the study aims to examine the relationship between teachers' patience and professional resilience levels. In this context, the sub-objectives of the study are as follows:

1. What are the patience levels of teachers?
2. What are the professional resilience levels of teachers?
3. Do the patience levels of teachers show a significant difference according to their gender, professional seniority, educational level, educational status, and the number of teachers in their schools?
4. Do teachers' professional resilience levels show a significant difference according to their gender, professional seniority, educational level where they work, educational status, and the number of teachers in their schools?
5. Is there a statistically significant relationship between teachers' patience levels and their professional resilience?

Method

This study, which examines the relationship between teachers' patience levels and their professional resilience, was designed in the relational survey model, one of the quantitative research models. Survey models are research approaches that aim to describe a past or current situation as it exists (Karasar, 2010).

Population-Sample

The population of the study consists of 6443 teachers working in public schools in Kartal (3657) and Tuzla (2786) districts of Istanbul province in the 2022-2023 academic year. Krejcie & Morgan (1970) reported in the sampling table that it is sufficient for the sample to be in the range of 357-370 to represent the universe in the range of 5000-10000 with an error rate of 5%. However, considering the possible data losses, more data were collected. The sample of the study consisted of 404 teachers selected from the population using a simple random sampling method. Personal information of the sample group is presented in Table 1.

Table 1. Frequency and Percentage Values of Personal Information

Variable	Groups	Frequency (f)	Percentage (%)
Gender	Female	221	55
	Male	183	45
	Total	404	100
Educational Status	Associate/Undergraduate Degree	298	74
	Postgraduate Degree	106	26
	Total	404	100
Professional Seniority	0-10 years	151	37
	11-20 years	182	45

	21 years or more	71	18
	Total	404	100
Education Level	Primary School	109	27
	Secondary School	169	42
	High School	126	31
	Total	404	100
Number of Teachers in the School	20 or fewer	56	14
	20-40	178	44
	40 or more	170	42
	Total	404	100

Data Collection Tools

The data collection tool consists of three parts. The first section includes questions to learn the personal information of the participants. The second and third sections include the "Teacher Patience Scale" developed by Meriç and Erdem (2022) and the "Teacher Professional Resilience Scale" developed by Näswall, Malinen, Kuntz, and Hodliffe (2019) and adapted into Turkish by Limon (2022).

Teacher Patience Scale

The "Teacher Patience Scale" measuring the patience levels of teachers was developed by Meriç and Erdem (2022). Consisting of 11 items and two sub-dimensions (teaching and interaction), the total variance explained by the scale is 46.69%. In addition, the results of the confirmatory factor analysis revealed that the model showed a good fit ($\chi 2/sd = 1.83$, $p < .05$; AGFI = .92, CFI = .95, TLI = .94, RMSEA = .06, SRMR = .05). Croanbach's Alpha (α) reliability coefficients for the sub-dimensions of the scale were .80 for the teaching sub-dimension and .70 for interaction. Croanbach's Alpha (α) reliability coefficient for the overall scale was .82.

Teacher Professional Resilience Scale

The “Teachers’ Professional Resilience Scale” measuring teachers’ professional resilience levels was developed by Näswall, Malinen, Kuntz, and Hodliffe (2019) and adapted into Turkish by Limon (2022). Consisting of 9 items and one dimension, the total variance explained by the scale is 54%. The confirmatory factor analysis results revealed that the model showed a good fit ($\chi 2/df=1.68$ $p<.05$; RMSEA= .07; CFI=.97 and SRMR= .05). Croanbach's Alpha (α) reliability coefficient of the scale was .85.

Data Collection, Processing, and Analysis of Data

Necessary legal permissions were obtained from the teachers who constituted the sample of the study before starting data collection. Then, the data were collected by sending the link to the online form containing the data collection tools to the teachers who voluntarily participated in the study by the researchers. The data belonging

to 404 scales filled out by the participants through the link sent were included in the analysis. The collected data were analyzed using the SPSS 25.0 program. Before starting the analysis, it was examined whether the collected data met the normality assumptions. George and Mallery (2003) state that if the skewness and kurtosis coefficients are within the range of ±2, the distribution of the data meets the normality assumption. Based on this information, the skewness and kurtosis values and Q-Q graphs of the data were examined and it was concluded that the scores of teaching (-,170 to -1,122), interaction (-,072 to -1,029), patience (scale total score) (-,165 to -1,164) and resilience (scale total score) (-,064 to -,988) were within the normal distribution limits.

In the analyses, the significance of the difference between the means was tested at .05 level. In the interpretation of arithmetic means, the range of 1.00-1.79 was considered as "very low", 1.80-2.59 as "low", 2.60-3.39 as "medium", 3.40-4.19 as "high" and 4.20-5.00 as "very high". In the interpretation of the correlation analysis, the range of .00-.30 was accepted as "low", the range of .31-.70 as "medium" and the range of .71-1.00 as "high" level relationship (Büyüköztürk, 2011). Descriptive statistics, correlation, and regression analysis were used to analyze the data.

Findings

The arithmetic mean, standard deviation, and skewness-kurtosis values of teachers' patience levels and professional resilience levels are presented in Table 2.

Table 2. Frequency and Percentage Values of Personal Information Arithmetic Mean, Standard Deviation, and Skewness-Kurtosis Values Related to the Variables of the Study

	$\bar{x}$	Sd	Skewness	Kurtosis
1. Teaching	3,99	,69	-,170	-1,122
2. Interaction	3,83	,64	-,072	-1,029
3. Teacher Patience Scale (Total)	3,92	,63	-,165	-1,164
4. Teacher Professional Resilience Scale (Total)	3,94	,61	-,064	-,988

When Table 2 was examined, it was found that teachers' patience levels (scale total score) ($\bar{x}$=3.92) and professional resilience levels (scale total score) ($\bar{x}$=3.94) were at high levels.

Comparison of Teachers' Patience Levels and Professional Resilience Levels in Terms of Demographic Variables

Independent groups t-test was conducted to determine whether the patience scale and professional resilience scale scores of the teachers constituting the sample group showed a significant difference according to gender variable.

Table 3. Independent Groups t Test Results for Gender Variable

Variable	Groups	n	$\bar{x}$	Sd	Se	t Test		
						t	*Df*	*p*
Teacher Patience Scale (Total)	Female	221	3.95	.63	.04	.94	402	.344
	Male	183	3.89	.63	.04			
Teacher Professional Resilience Scale (Total)	Female	221	3.96	.58	.03	.74	402	.459
	Male	183	3.92	.64	04			

As seen in Table 3, as a result of the independent samples t-test, the difference between the arithmetic averages of the groups for the patience scale (t= .94; P>.05) and professional resilience scale (t= .74; P>.05) scores according to gender variable was not found significant.

Independent samples t-test was conducted to determine whether the patience scale and professional resilience scale scores of the sample group teachers showed a significant difference according to the education level variable.

Table 4. Independent Groups t Test Results for Education Level Variable

Variable	Groups	n	$\bar{x}$	Sd	Se	t Test		
						t	*Df*	*p*
Teacher Patience Scale (Total)	Associate/Undergraduate Degree	298	3.95	,62	,03	1.77	402	.078
	Postgraduate Degree	106	3,83	,66	,06			
Teacher Professional Resilience Scale (Total)	Associate/Undergraduate Degree	298	3,96	,62	,03	1.08	402	.279
	Postgraduate Degree	106	3,89	,59	,05			

As seen in Table 4, as a result of the independent samples t-test, the difference between the arithmetic averages of the groups for the patience scale (t= 1.77; P>.05) and professional resilience scale (t= 1.08; P>.05) scores according to the educational status variable was not found significant.

One-way analysis of variance (ANOVA) was conducted to determine whether the patience scale and professional resilience scale scores of the sample group teachers showed a significant difference according to the professional seniority variable.

Table 5. One-Way Analysis of Variance (ANOVA) Results for Professional Seniority Variable

Variable	Groups	n	$\bar{x}$	Sd	Source of Variance	Sum of Squares	df	Mean of Squares	F	p	LSD
Teacher Patience Scale (Total)	0-10 years	151	3,92	,60	Between Groups	4,21	2	2,10	5,29	,005	1-3
	11-20 years	182	4,00	,63	Within Groups	159,51	401	,39			
	21 years or more	71	3,71	,68	Total	163,72	403				2-3
	Total	404	3,92	,63							
Teacher Professional Resilience Scale (Total)	0-10 years	151	3,95	,58	Between Groups	2,63	2	1,31	3,53	,030	1-3
	11-20 years	182	4,00	,60	Within Groups	149,84	401	,37			
	21 years or more	71	3,77	,66	Total	152,48	403				2-3
	Total	404	3,94	,61							

As seen in Table 5, as a result of the one-way analysis of variance (ANOVA), the difference between the arithmetic averages of the groups for the patience scale (F= 5.29; p<.05) and resilience scale (F= 3.53; p<.05) scores according to the professional seniority variable was found significant. Post hoc analysis was performed to determine which groups the significant difference was between. Before this analysis, Levene's test showed that the variances were homogeneous. Therefore, LSD analysis was performed. As a result of the analysis, it was found that the significant difference in both scale scores was in favor of teachers with 20 years and less seniority. In other words, teachers with 21 years and more professional seniority have lower levels of both patience and professional resilience.

One-way analysis of variance (ANOVA) was conducted to determine whether the patience scale and professional resilience scale scores of the teachers in the sample group showed a significant difference according to the level of education.

Table 6. One-Way Analysis of Variance (ANOVA) Results for the Variable of Educational Level of Employment

Variable	Groups	n	$\bar{x}$	Sd	Source of Variance	Sum of Squares	df	Mean of Squares	F	p	Dunnett C
Teacher Patience Scale (Total)	Primary School	109	4,50	,42	Between Groups	71,94	2	35,97	157.17	.000	1-2
	Secondary School	169	3,95	,53	Within Groups	91,77	401	,22			1-3
	High School	126	3,39	,43	Total	163,72	403				2-3
	Total	404	3,92	,63							
Teacher Professional Resilience Scale (Total)	Primary School	109	4,40	,45	Between Groups	45,37	2	22,68	84.93	.000	1-2
	Secondary School	169	3,96	,58	Within Groups	107,10	401	,26			1-3
	High School	126	3,52	,46	Total	152,48	403				2-3
	Total	404	3,94	,61							

As seen in Table 6, as a result of the one-way analysis of variance (ANOVA), the difference between the arithmetic averages of the groups for the patience scale (F= 157.17; p<.05) and professional resilience scale (F= 84.93; p<.05) scores according to the level of education.

Post hoc analysis was performed to determine which groups the significant difference was between. Before this analysis, it was found that the variances were not homogeneous with Levene's test. Therefore, Dunnett C analysis was performed. As a result of the analysis, it was found that there was a significant difference in both scale scores between teachers working in primary schools and teachers working in secondary schools and high schools in favor of teachers working in primary schools; and between teachers working in secondary schools and teachers working in high schools in favor of teachers working in secondary schools. In other words, as the level of education in which teachers work increases, their patience levels and professional resilience levels decrease.

One-way analysis of variance (ANOVA) was conducted to determine whether the patience scale and professional resilience scale scores of the sample group teachers show a significant difference according to the number of teachers in the school where they work.

Table 7. One-Way Analysis of Variance (ANOVA) Results for the Number of Teachers in the School

Variable	Groups	n	$\overline{X}$	Sd	Source of Variance	Sum of Squares	df	Mean of Squares	F	p
Teacher Patience Scale (Total)	20 or fewer	56	3,93	,66	Between Groups	,70	2	,35	,87	.419
	20-40	178	3,96	,63	Within Groups	163,01	401	,40		
	40 or more	170	3,87	,62	Total	163,72	403			
	Total	404	3,92	,63						
Teacher Professional Resilience Scale (Total)	20 or fewer	56	3,91	,64	Between Groups	,11	2	,05	,15	.861
	20-40	178	3,96	,62	Within Groups	152,36	401	,38		
	40 or more	170	3,93	,59	Total	152,48	403			
	Total	404	3,94	,61						

Relationships between Variables

The relationships between the dependent and independent variables of the study are presented in Table 8:

Table 8. Relationships between Variables

		Teacher Professional Resilience Scale
Teacher Patience Scale	r	,856**
	p	,000

**p<.001; N=404

As a result of Pearson correlation analysis, it was found that there was a positive, high-level, and significant relationship (r= .856; p<.001) between teachers' patience levels and their professional resilience.

Simple linear regression analysis was conducted to examine the effect of teachers' patience levels on their professional resilience and the results are presented in Table 9.

Table 9. The effect of teachers' patience levels on their professional resilience.

Model	B	Std. E.	β	t	p	R	R^2	F	p
Constant	0.705	0.099		7.117	0.000				
Patience	0.826	0.025	0.856	33.133	0.000	.856	.73	1097.76	0.00

As seen in Table 9, as a result of the simple linear regression analysis, teachers' patience levels were found to be a significant predictor of their professional resilience (F(1-402)=1097.76; p<0.001). It was determined that teachers' patience levels explained 73% (R2=0.73) of the variance in their professional resilience. When the t-test result regarding the significance of the coefficient of the predictor variable in the regression equation (B= .826) is analyzed, it is seen that the patience scale is a significant predictor of the professional resilience scale (p<0.000).

According to the regression analysis results, the regression equation predicting the professional commitment scale is as follows:

Professional resilience = (.826 x Patience) + 0.705

Discussion and Conclusion

This study, which examined the relationship between teachers' patience levels and their professional resilience, was conducted with teachers working in public schools in the Kartal and Tuzla districts of Istanbul province in the 2022-2023 academic year. As a result of the research, it was determined that the patience levels of teachers were high. In a study examining the relationship between teachers' psychological resilience, patience, and happiness levels, similar to the results of this study, it was observed that teachers' patience levels were above average (Ulukan & Ulukan, 2021). It is known that showing high patience against unwanted events distracts people from unwanted emotional states such as depression and enables them to accept the events (Schnitker, 2012). Considering that teaching is a profession that requires patience (Duman & Taş, 2021; Meriç & Erdem, 2023; Shishavan & Sadeghi, 2009), it can be said that the results obtained are desirable. As a result of the research, it was seen that teachers' professional resilience was also high. When the literature is examined, it is seen that the studies support the results obtained from this research and show that teachers' professional resilience is high (Argon & Kaya, 2018; Li et al., 2019; Limon, 2022; Peixoto et al., 2020). Based on these results regarding teachers' high resilience levels, it can be said that teachers use the available resources in the

right way, pursue their profession with a high sense of purpose, have responsibility, and establish healthy relationships with other stakeholders they are in contact with (Limon, 2022).

The findings of the study showed that teachers' scores on the patience and professional resilience scale did not differ significantly according to their gender, educational status, and the number of teachers in their schools. In a study supporting the results of this research, it was observed that while the patience levels of teachers in the interaction dimension did not differ according to gender, the general patience level and the patience level in the teaching dimension of female teachers were lower (Meriç & Erdem, 2023). While the patience levels of teachers in this study did not show a significant difference according to their educational background, in another study, it was determined that the patience levels in the teaching dimension differed in terms of educational background and the patience levels of associate degree graduates in the teaching dimension were higher than both undergraduate and graduate graduates. In the study, it was seen that associate degree graduates were generally experienced teachers with more years of service and it was evaluated that such a difference occurred due to higher professional experience (Meriç & Erdem, 2023). Although studies are showing that teachers' professional resilience does not differ according to gender and educational status (Argon & Kaya, 2018; Brouskeli et al., 2018; Limon, 2022), it is possible to see different results in the literature.

In the study, it was examined whether the variable of the number of teachers in the school where the teachers work could affect their work distribution and their communication with their stakeholders, and it was seen that the patience and professional resilience of the teachers did not differ significantly according to the number of teachers in the school. No study was found to address this variable. According to another finding obtained from the study, teachers' patience scale and professional resilience scale scores show a statistically significant difference according to the professional seniority variable. Both patience and resilience levels of teachers with 21 years or more of professional seniority are lower than those of teachers with less than 21 years of seniority. When similar studies were examined, it was seen that as professional seniority increases, patience levels and professional resilience levels increase in support of the result obtained from this study (Botou et al., 2017; Meriç & Erdem, 2023). The increase in teachers' experience with their advancing age will enable them to be more patient and more resilient in overcoming difficulties (Bobek, 2002; Gu & Day, 2007; Limon, 2022).

According to another finding obtained from the research, teachers' patience scale and professional resilience scale scores show a statistically significant difference according to the level of education in which teachers work. According to this finding, patience and professional resilience levels decrease as the level of education at which teachers work increases. The patience and resilience levels of teachers working in primary schools are higher than those working in middle and high schools. Similarly, the patience and resilience levels of teachers working in secondary schools are higher than those working in high schools. When similar studies are examined, similar to the result obtained from this study, it is seen that teachers' professional resilience is higher at lower levels of education such as preschool and primary school compared to other levels (Argon & Kaya, 2018; Brouskeli et al., 2018; Limon, 2022). It is thought that the fact that teachers work with students in the younger age group reflects positively on their resilience levels (Limon, 2022). However, there is a need to

conduct research examining whether teachers' patience levels differ according to the type of level they work at.

In the study, it was found that there was a positive, high-level, and significant relationship between teachers' patience levels and their professional resilience. As a result of the regression analysis, it was found that the patience scale was a significant predictor of the professional resilience scale. When the literature is examined, studies show that there is a relationship between patience and psychological resilience (Eliüşük, 2014; Khormaei et al., 2017). Considering that professional resilience can be considered as a sub-dimension of psychological resilience (Çetin, 2020), it is thought that the studies can support the findings obtained from this study. Again, in a study conducted with teachers, a significant relationship was observed between teachers' patience and psychological resilience (Ulukan & Ulukan, 2021), while in another study, a negative relationship was observed between teachers' patience levels and burnout (Meriç & Erdem, 2023). While there are a limited number of studies examining the patience levels of teachers in the literature (Meriç & Erdem, 2022; Meriç & Erdem, 2023; Niyazibeyoğlu & Dağcı, 2023; Türkgeldi, 2019; Ulukan & Ulukan, 2021), no study was found to address the relationship between teachers' patience and professional resilience levels. Patience can be considered a personality trait that enables teachers to continue their profession successfully and is an important life value that can increase their professional resilience (Gültekin, 2020; Norling, 2009). Therefore, knowing how teachers' patience levels are related to their professional resilience can shed light on practices that can increase teachers' patience levels. Based on all these, it is thought that the research will contribute to the field.

Recommendations

As a result of the research, it is recommended that teachers' patience and professional resilience levels should be further examined within the scope of various demographic variables. In this way, the factors affecting teacher patience and resilience can be better recognized and intervention plans can be made to increase patience and resilience in the desired way. Considering that improving teachers' patience levels increases their professional resilience, it is recommended that plans that can increase teachers' patience should be made both by the country administration and the administration of the institution where they work. Organizing various psychoeducation programs by school psychological counselors and universities to increase the patience level of teachers and implementing them at regular intervals can make significant contributions to the professional resilience of teachers by increasing patience, which is a developable trait. Considering that the increase in teachers' patience and professional resilience will have important reflections on students and the education system, researchers are recommended to increase the number of quantitative and qualitative studies examining the relationships between patience and professional resilience. There are also some limitations in this study. The study is limited to teachers working in public schools in Kartal and Tuzla districts of Istanbul province in the 2022-2023 academic year and the data obtained as a result of teachers' responses to the scale questions used in the research.

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Authors Information

Özge Erduran Tekin
https://orcid.org/0000-0002-4052-1914
National Defense University,
Yeşilköy Mah., Eski Havalimanı Cad., 34149
Bakırköy/İstanbul/Türkiye

Semih Çayak
https://orcid.org/0000-0003-4360-4288
Marmara University
Atatürk Eğitim Fakültesi Göztepe Yerleşkesi 34722
Kadıköy/İstanbul/Türkiye

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Brushstrokes of Thoughts and Perceptions in Science Learning

Christopher Dignam
Governors State University, United States

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Abstract

According to J. Epstein's (2022) Theory of Overlapping Spheres of Influence, three influential spheres are symbiotic and overlap: school, family, and community. Social networks and social capital are rendered through the implementation of cooperative, interactive partnerships among families, educators, and communities when they are centered on children's growth and development. Additionally, L. S. Vygotsky's (1978) Theory of Cognitive Development asserts social interaction between learners is central to learners developing understanding, as concepts are first formed on the social level followed by the individual level. This qualitative research study examined the thoughts, perceptions, and acuities of students, parents, and teachers as they partnered during high school science inquiry investigations and their perceptions regarding social interactions and cognition. This qualitative phenomenological study examined the development of social skills in students and influencing factors in motivating students to take ownership of the learning. This study also examined the assimilation and accommodation of cognition in study participants' perspectives as they engaged in scientific, experiential learning with implications for Science, Technology, Engineering, Art, and Mathematics (STEAM) teaching and learning.

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Introduction

Although home-school relationships decline at the secondary level, which often inhibits active parent involvement, opportunities to forge social networks and build social capital between the home and school still exist (Epstein & Sheldon, 2022). The decline in social networking is influenced by students beginning to establish independence as adolescents and parents enabling student independence (Epstein & Connors, 1994).

Corresponding Author: Christopher Dignam, cdignam@govst.edu

Despite science being adversely impacted in terms of high school home-school engagement for social networking and building social capital, strategies exist to elicit opportunities for students, parents, and teachers to form authentic social bonds (Epstein et al., 1999). Adolescents need the continued guidance and support of parents as they mature and assume increased responsibilities. As a countermeasure to this phenomenon and implications for high school science, teachers at the secondary level can foster social capital by actively engaging parents in learning activities (Dignam, 2023b; Epstein et al., 1999). Not only is the engagement of students through partnering beneficial for cognitive growth, it is superseded and influenced by the social interactions of students and their perceptions of learning.

When schools create conditions for developing a community of practice via participatory, reciprocal parent-teacher-student relationships, they forge the establishment of a communal learning system. Many schools promote the idea of partnering with parents and families to establish communal goals. However, teaching and learning largely occurs in isolation from the home and takes place within the school. Consequently, the home and school share common social goals but operate independently of one another. Conversely, when the home and school actualize their relationship as a mutually supportive social network, they form linkages via a partnership of common interests and shared engagement for cognition (Darling-Hammond et al., 2020; Vygotsky, 1978).

Supportive Literature

Mutualistic home-school partnerships are those that move beyond passive school engagement and bounded invites for parents with occasional communications sent home by teachers and towards a linked relationship of working together to actively engage and support social networks. Home-school partnerships that are cooperative and interactive forge relationships that are mutualistic, reciprocal, and provide substrate for social capital. With social capital, learners develop social skills to further develop understanding for cognition via social partnerships and finally as individuals (Vygotsky, 1978).

The connection between homes and schools tends to weaken at the secondary school level, leading to a reduction in active parent involvement. The decrease in parental engagement during high school is influenced by the emerging independence of adolescents and the encouragement of self-sufficiency by parents (Catsambis & Garland, 1997; Epstein & Sheldon, 2022). Additionally, parents often feel a decrease in confidence regarding their own knowledge of science content, posing a significant obstacle to their involvement in high school science education. Despite adolescents developing independence, students still require ongoing guidance and support from parents as they take on increased responsibilities. Notably, areas experiencing a decline include discussions about school, homework, and parental assistance with homework (Epstein et al., 1999).

Among the most influential factors affecting student learning are the student's home environment and varying levels of parental support (Epstein & Sheldon, 2022; Shymansky et al., 2010). Building a supportive environment through social support is crucial for fostering not only learning but also empowering students to acquire knowledge (Epstein, 1995; Mahoney et al., 2021). Supportive relationships contribute to emotional connections, the development of interpersonal skills, and the establishment of systems that help students achieve success (Darling-Hammond et al., 2020). To promote the development of constructivist scientific inquiry and literacy skills in students, encouraging supportive and reciprocal home engagement aids in nurturing the whole child, addressing both science learning and social skills development. Well-designed support systems contribute to the social, emotional, and academic achievements of all learners (Osher et al., 2018). Involving parents in activities such as homework, learning tasks, or scientific investigations grounded in inquiry stimulates active learning, questioning, and the application of knowledge (Darling-Hammond et al., 2020).

The influence of parental involvement on student perceptions and motivation to learn remains significant, whether the student is in primary school or at the secondary level. Creating opportunities for parents and students to engage in scientific, interactive inquiry promotes students taking the lead in discussions about their school learning (Dignam, 2023a). These constructive, student-led conversations foster pro-social interactions and result in positive sentiments among parents, providing valuable insights into high school student learning (Epstein et al., 2021; Howard et al., 2020).

Influences on Cognition

Evidence suggests that factors such as family influence and students' personal interests outside the traditional school-learning setting significantly influence student interest in core science areas and Science, Technology, Engineering, and Mathematics (STEM) education (Funk & Hefferon, 2016; Shymansky et al., 2010). Both STEM and STEAM (Science, Technology, Engineering, Art, and Mathematics) learning play a vital role in fostering the development of critical thinking skills, which are essential life skills, and crucial for lifelong learning (Ross, 2011; Hebebci, 2022; 2023). Furthermore, collaborative and integrated learning experiences have a substantial impact on students' interests in science and STEM, playing a key role in providing supportive and enriching science and STEM learning experiences for students (Barakos et al., 2012).

Affording students and parents opportunities to participate in experiential, constructivist learning serves as a platform for building social capital. Moreover, the process of forging social skills and cooperative learning provides students with opportunities for developing conceptual understanding (Dewey, 1933; Piaget, 1972; Vygotsky, 1978). As students engage in constructing knowledge and self-assessing their progress, they cultivate

a profound understanding of curricular objectives and outcomes, thereby enhancing constructivist principles (Dewey, 1933; Perkins, 1999). Parental involvement in homework, activities, and investigations contributes to the academic and social development of students by offering continuous feedback, guidance, and suggestions for improvement. Hence, constructivist, experiential, interactive parental involvement creates opportunities for fostering student ownership of science learning (Kolb, 2014; Kolb et al., 1984; Piaget, 1972; Vygotsky, 1978).

Professional Erudition

Teachers are better positioned to support student learning when they engage in targeted professional growth (Kirner & Lebrun-Griffin, 2013). The researcher is a former high school science educator with approximately ten years of classroom experience and seventeen additional years of educational leadership experience as an administrator and in leading schools as a principal and district superintendent. The researcher has employed the term professional erudition during his tenure in leading schools and communities as a principal and superintendent, and with his students in higher education seeking educational degree attainment and licensure. Professional erudition is a form of professional practice-building that includes aspects of targeted professional development for episode growth as well as professional development for periodic growth through meaningful onsite underpinning (Dignam, 2023a).

As noted in the research design portion of the methods section of this article, data from 232 participating teachers provided needs assessment data and noted necessitated, improved professional development. Professional development typically consists of attending disparate, generally focused workshops or presentations. Site-based professional development differs from traditional professional development in that it involves specific individuals with a defined purpose (Strike et al., 2019). In addition, professional learning targets specific skills to stimulate ongoing professional growth and is revisited regularly. In this study, professional erudition was employed for teacher training, a term referenced throughout the article that encapsulates qualities of both site-based professional development *and* professional learning. Professional erudition offered continuous support to participating teachers throughout the study and established norms for collecting attitudinal and perception data from teachers. These data proved incredibly insightful in understanding the thoughts, perspectives, and the lived experiences of teachers concerning social interactions with students and parents during scientific learning.

Social Connections

Social connections are crucial in shaping collaborative efficacy, thereby supporting collective goals for developing understanding (Schieffer, 2016; Vygotsky, 1978; Woolley et al., 2015). Communication among

parents, students, and teachers is especially advantageous in fostering active collaboration during inquiry activities (Kaufmann & Ryve, 2019). When students participate in socially supportive inquiry, they are more likely to excel both academically and socially (Epstein & Sheldon, 2022; Woolley et al., 2015). For students to actively involve parents, the school environment needs to provide resources for teachers to establish positive relationships between the home and school for social capital (Darling-Hammond, et al., 2002; Darling-Hammond et al., 2016). When children engage with their environment, they have opportunities to shape learning and acquire knowledge (Piaget, 1972). Consequently, heightened interactions between children/students and parents during the completion of school assignments offer experiential learning and a platform for students to develop a deeper understanding (Epstein et al., 2021; Kolb, et al., 1984).

Cognition takes place through Piaget's processes of assimilation and accommodation, where the transformation of existing cognitive structures (assimilation) and the acceptance of new knowledge (accommodation) enables learners to adapt to their environment. Assimilation and accommodation happen simultaneously and alternately throughout one's life. Through these processes, meaning is constructed, and cognitive adaptation occurs (Piaget, 1972). Students with well-developed social networks tend to exhibit increased positive educational outcomes, and similarly, the greater the social supports, the more likely a student is to thrive in school (Darling-Hammond, 2020; Epstein & Sheldon, 2022).

Conceptual Framework

The conceptual framework employed in this qualitative phenomenological study involved utilizing multiple data sets to discern phenomenon and identify emergent themes from phenomenological attitudinal data (Creswell & Poth, 2018; Merriam & Tisdell, 2016; Teddlie & Tashakkori, 2009). A review of literature demonstrated the need for students to develop strong social skills for collaborating with other learners and developing conceptual knowledge (Mahoney et al., 2021). Literature also exhibited the importance of STEM and STEAM in facilitating inquiry, critical-thinking, and problem-solving skills for lifelong learning (Ross, 2011; Shymansky, 2010). When students feel good about learning, they are more likely to engage in constructing knowledge (Kolb et al., 1984; Vygotsky, 1978). The lived experiences, thoughts, and perspectives of students, parents, and teachers are relevant for discerning influential social factors in learning.

Research Objective

The objective of this study was to examine the conditions and influential dynamics of social interactions among students, parents, and teachers. The study sought to identify how students, parents, and teachers perceived one

another as a result of engaging one another during interactive, scientific inquiry learning. The study sought to conceptualize the lived experiences, thoughts, and perspectives of students, parents, and teachers.

Research Questions

This study was conducted to determine the following research questions:

1. What are the influencing emotive and cognitive factors in motivating students to take ownership of science learning in which they became self-managed, self-responsible, and self-directed?
2. What types of social interactions during science learning rendered the development of social capital and what were the perceptions of students, parents, and teachers during these processes?
3. How does forming a community of practice between the home and school in STEAM at the secondary level facilitate social change?

Method

Two teachers participated in professional erudition focused on STEAM instructional methodologies, communications, and engaging parents in science learning. Over a six-week period, 131 parents and students created and maintained dialogue journal entries during experiential, interactive science learning. Dialogue journals served as a platform for parents and students to record thoughts, perceptions, and perspectives regarding social interactions and science learning. The sequence of entries involved students first, followed by parents and then teachers. Students provided their respective dialogue journals to each teacher at the end of each week, and teachers returned the journals to students at the beginning of the following week.

Parents and students were offered a variety of opportunities for reflection, with many of these self-reflective moments arising from dialogue journal entries parents and students crafted while engaging in interactive inquiry activities. Additionally, both parents and students had chances to reflect on their experiences through one-on-one interviews and open-ended questionnaires. Data collected identified themes and were triangulated to reinforce the drawn conclusions.

Rubrics

The researcher provided professional erudition to participating teachers, equipping them with skills to guide students in creating rubrics for self-assessing performances alongside parents. Teachers demonstrated the use of rubrics in assessing growth and facilitated students in developing criteria to evaluate and assess learning. Teachers illustrated the process of creating criteria for measuring actual knowledge and understanding. Students actively participated in developing a rubric, which they then shared with parents for self-assessment. The rubrics, crafted by students, were employed with parents to evaluate student performances.

Student Constructed Exams

The researcher provided participating teachers professional erudition to enhance their skills in guiding students to self-generate and construct examinations. Cooperating teachers utilized these professional erudite opportunities to engage students in the creation of exams that were implemented during the study.

Dialogue Journals

During interactive inquiry learning, parents, students, and teachers documented entries in dialogue journals. The researcher analyzed attitudinal data in these journal entries to ascertain parental and student perceptions regarding student growth, participation, and ownership of the learning. Attitudinal data from journal entries were cross-referenced with surveys, questionnaires, and interviews to ensure comprehensive and reliable insights.

Student Self-Assessments

Student self-assessments served as the primary instruments for gathering data to evaluate the development of social skills and self-perceptions regarding social interactions. The researcher provided professional erudition to participating teachers, guiding them in incorporating student self-assessments through diverse means, such as student journal entries, student-designed rubrics, and student-constructed exams.

Keyword Search

The researcher utilized keyword search techniques to analyze student, parent, and teacher dialogue journal entries. Keyword search revealed themes and relationships among students, parents, and teachers.

Results

Themes derived from data encompassing dialogue journals, surveys, open-ended questionnaires, one-on-one interviews, and keyword search, were analyzed for comparisons, codification, cross-interpretations, and triangulation.

Rubrics

Attitudinal data from parents and students revealed that the rubrics not only enabled students to participate in assessing their work but also fostered social skills development as students progressed in becoming self-directed, self-managed, and self-responsible learners. In a journal entry, one of the teachers recorded, “The use of the rubrics the students made helped the performance assessments be more objective and assessed students based on their learning.”

Student Constructed Exams

Triangulation of attitudinal data from surveys, questionnaires, and interviews revealed that students exhibited an understanding of concepts and science knowledge. Students achieved and developed a sense of responsibility for their own learning and believed constructing their own exams was one of the most influential processes of the study. A participating teacher indicated in a journal entry, “This was easier to do than I originally thought. It helped my students to demonstrate self-responsibility because they controlled their test questions we used to measure their understanding.”

Dialogue Journals

Attitudinal data revealed dialogue journal entries created opportunities to establish positive, pro-social relationships with both parents and students. Perceptions from parents and students indicated that the dialogue journals were instrumental in promoting constructive communication among parents, students, and teachers. Journals facilitated meaningful dialogue, allowing students to engage in self-reflections and self-assessments for improvement and achievement. Through this process, students gained an understanding of the modifications needed to succeed, informing parents and teachers about their knowledge and comprehension.

Student Self-Assessments

Student self-assessments proved to be key in facilitating student growth through self-reflection and identifying standards for achieving and succeeding. Both students and teachers noted the influence self-assessments had in terms of empowering students to make decisions regarding self-success. A teacher's journal entry highlighted, "When students are provided opportunities to reflect on their progress and performances they determine the changes and adjustments they need to make in order to be more successful.” Providing students opportunities to engage in developing and employing self-assessments afforded learners the freedom to identify and create outcomes for measuring success, which also led to feelings of ownership for learning.

Keyword Search

When concentrating on parents, keyword search revealed positive ideas associated with collaborating with the parent's child. Examining student journal entries via keyword search illuminated ideas connected to conditions influencing support and efficacy development in students, parents, and teachers. Employing keyword search analysis for teacher entries afforded insights into teachers' perspectives on maintaining effective and interactive parental involvement in STEAM learning. Authentic communication consistently emerged as a common thread, interwoven throughout all themes. The participants' experiences were characterized by a unified, supportive, skill-building, self-motivating environment, emphasizing authentic communication as a foundation for building social capital.

Discussion

Dialogue journal entries provided a wealth of self-reflective discourse in which students initiated dialogue, followed by parents, and finally teachers, who acknowledged student-parent discourse and occasionally provided encouragement. Teachers, on the other hand, maintained private journals to memorialize thoughts and perceptions at random for review by the researcher at the conclusion of the study. The following attitudinal data provides insight regarding teacher, parent, and student thoughts and their lived experiences highlighting social networking, social capital building, and influences on science learning.

Teachers

A teacher's journal entry stated utilizing the journals fostered student achievement of inquiry learning. "Parents watch the students develop self-responsibility. I think [REDACTED] has given parents insight into children's abilities and growth that would have otherwise not occurred." In another entry, the teacher reflected on accountability as she noted, "Students have become more involved and responsible for their progress. Parent involvement and monitoring through journal entries produced better student participation. I believe this helps students become more responsible for their progress and think it's a key for greater participation. It also helped to improve listening between parents and students and what they had to say. I believe this increased the nature and value of communication in my classroom."

In terms of teachers' thoughts and perceptions regarding social change, teachers recorded a variety of entries as noted below and in Figure 1.

> "*I think it's safe to say that involving the parents also improved the relationship between the parents and me.*"
>
> *"Students can't get the self-esteem they need developed in high school if they're not supported by parents and teachers. I think that using a project like this has really helped my freshman develop confidence."*
>
> *"The most important thing is using the self-assessments. I'm actually surprised at how much of an impact this had so early in the school year. Using the self-assessments with the journaling really made a difference in my students rapport with me….or maybe my rapport with them."*

One of the participating teachers noted, "using the journal entries were effective in helping the students reflect on their learning and problem-solving skills. It helped parents understand student growth and development." In terms of professional erudition, teachers noted, "I don't think that there would have been such a high level of student success if it wasn't supported by all the professional development. Most of the professional development I get is disconnected from what I really do. There needs to be PD like this if this project is done

with parents again or at another school. It really supported me and made it possible to do it smoothly" and "Giving real professional development was effective and it should be used. I don't understand why we always get the same nonsense."

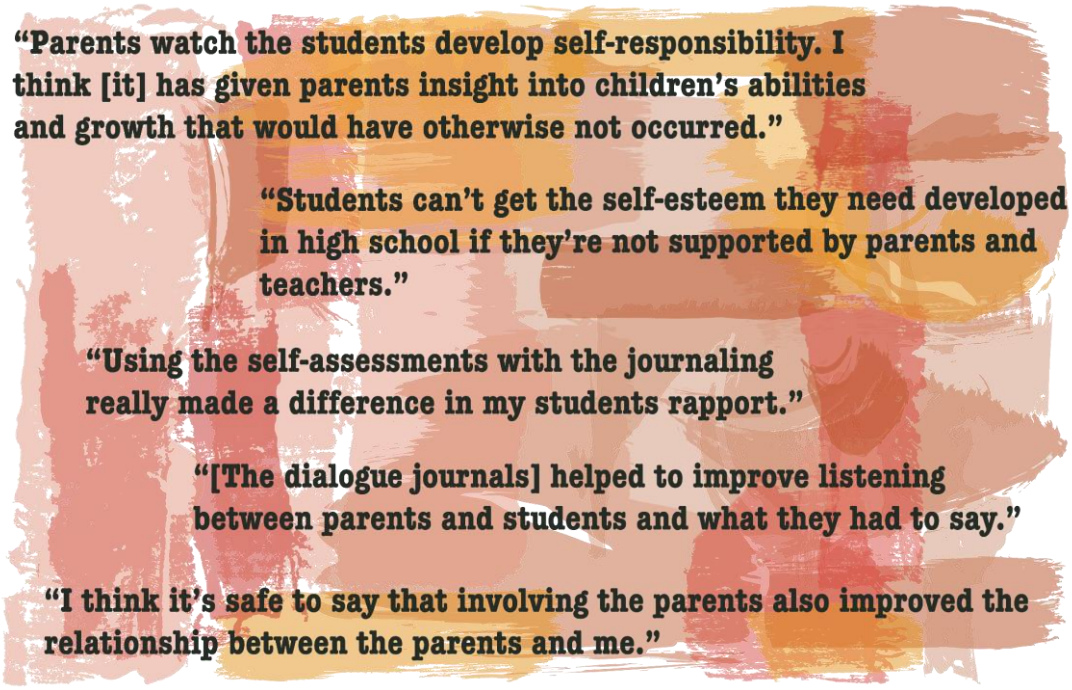

Figure 1. Teacher response exemplars

Parent Responses

During an interview with a parent regarding her experiences corresponding with her child through the dialogue journal, the parent responded that she "had never done anything like this before" and this strategy "made it easier to talk about all types of stuff" with her child. In terms of the dialogue journals, another parent said that she felt like she knew her daughter "better" and the parent "watched [her child] learn and I learned with her." The dialogue journals helped parents and students better communicate and develop a social rapport. These parents indicated that they felt they were able to gauge their children's learning and observe them flourish. A parent stated on a survey that the strategy of designing and choosing questions to answer on the exam assisted his child in becoming more "*responsible for his school work and his grade*" because the child was "*given a lot more control on even the tests and grading*." As a result, the parent concluded that the child "*was responsible for his own work and earned his grade. He worked hard.*" Another parent made a dialogue journal entry that said the student "*never liked science before and now she loves it. Now she knows she can do it*."

Relevant parent responses are noted in Figure 2, with additional exemplars including:

"*I think it will be lots of fun and also a great re-learning experience for me*." "*It has been a great experience for me and my child to go out and experience nature, at last, from our busy lives. I had a great time!! It was*

an educational experience for my child and a wonderful experience for me." A parent memorialized thoughts regarding social bonding and relationship-building, "*This has been a great opportunity to spend some time and work good together.*"

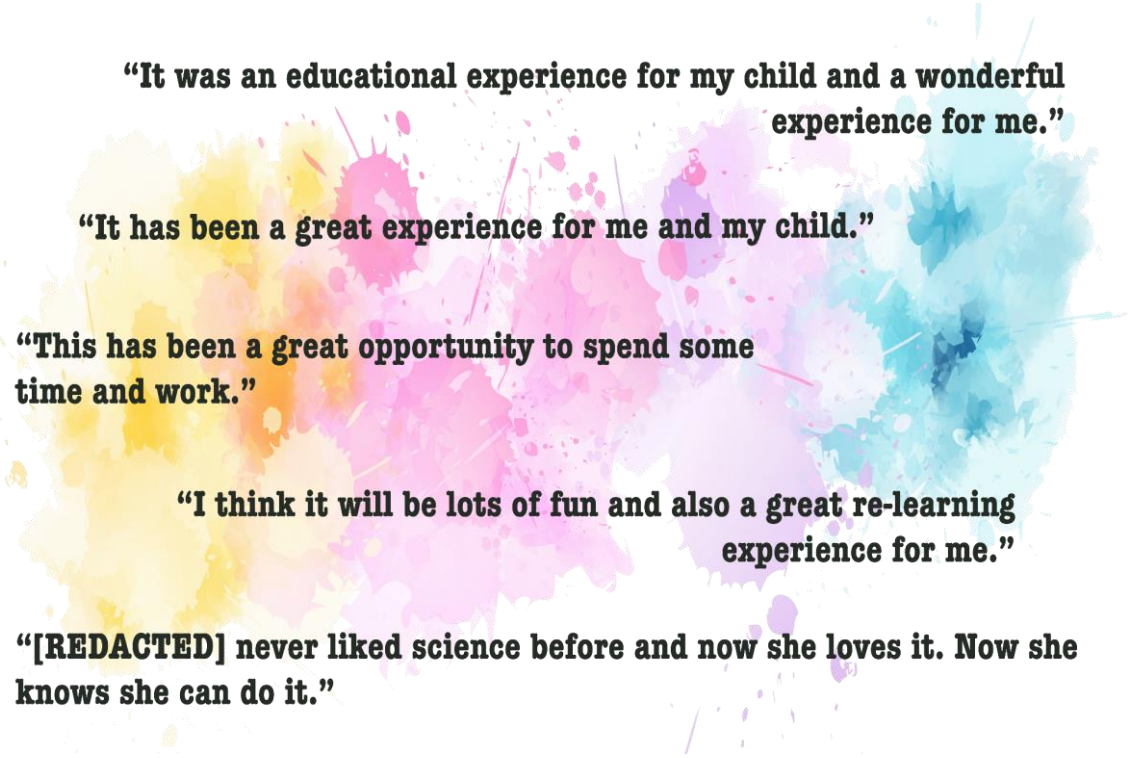

Figure 2. Parent response exemplars

Student Responses

Many students included expressions such as "*felt like a real scientist*" in interviews and on questionnaires they completed. Triangulation supported the assertion that empowering students to create the rubric and exam enabled students to develop social capital to take ownership of the learning. These data indicated that the activities that were most effective in motivating students when implementing strategies were providing students with an authentic experience and enabling students to utilize questioning strategies they could reflect on and create self-assessments.

Formative assessments enabled parents and students to repeat their performances based on reflection and planning strategies to utilize and achieve. When survey data was analyzed, 79.3 % of students surveyed said that the weekly reflection and progress plan entries were helpful in assisting them in developing a better understanding of scientific concepts. During an interview conducted with a student, the student described how the weekly reflection entries helped in the development of inquiry skills. The student stated, "*I thought about what I did and how much I learned and then I thought about how I could do better. So I made a list of stuff I would change next time to improve my work.*" Another student was asked how this involvement strategy helped the student develop inquiry skills and take ownership of the learning. The student responded, "*It's like I learned from my own mistakes. I knew what things I had to change to do better and it was up to me. It was my work.*"

These involvement strategies, coupled with the interactive parent involvement inquiry activity in an authentic setting provided students with an environment and forum in which they could achieve and succeed. Students were enabled to improve their performances through self-reflecting, assessing, and making plans to excel. Students were empowered to take control of the learning and develop self-responsibility and ownership of the work.

Additional, relevant student responses (Figure 3) included:

"*I really do think this project is helping me in my skills to identify things and make assumptions. Since this project requires a lot of organization, it has helped me become much more organized and neater in my work*" and "*My dad helped me use the rubric I made in class. I think we did a great job on this and I liked grading my project with him. We never did that before*."

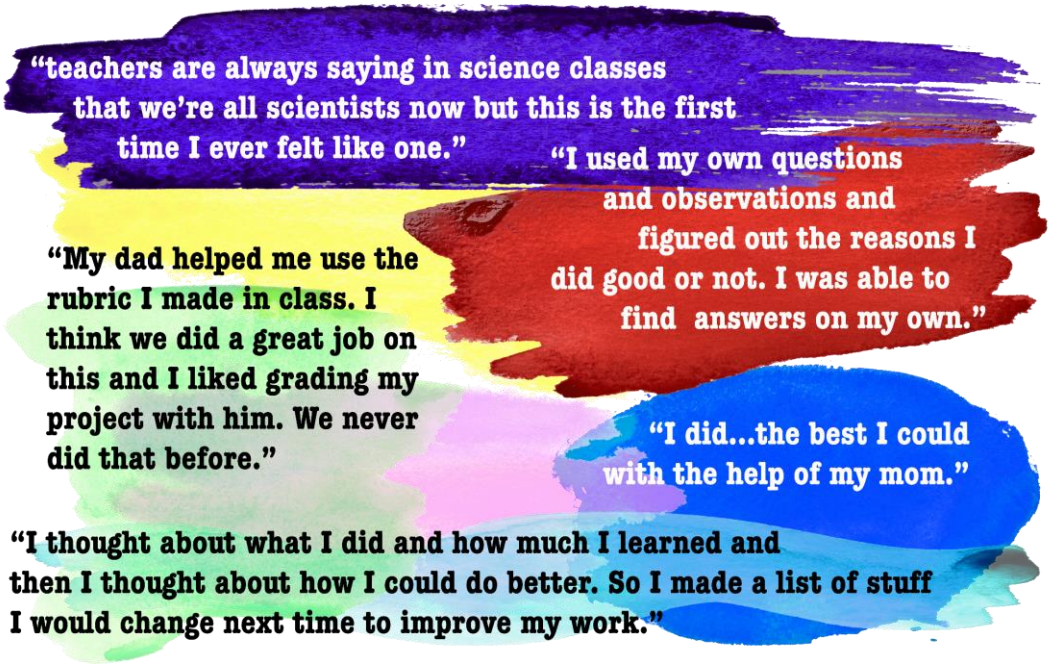

Figure 3. Student response exemplars

Conclusion

The utilization of student-derived rubrics, student-constructed exams, dialogue journal entries, self-assessments, keyword search, interviews, questionnaires, and surveys provided insight regarding the lived experiences of students, parents, and teachers throughout the course of this study. In terms of the influencing emotive and cognitive factors that motivated students to take ownership of science learning in which they became self-managed, self-responsible, and self-directed, a number of key findings were identified (Figure 4). Social influences related to the interactive nature of the learning environment and the ability of students to construct the rubric and parents to partner in identifying criteria for achievement resulted in a sense of efficacy. In addition, the pro-social atmosphere of the learning environment supported students in academically

achieving through the construction of self-assessments and questioning strategies developed during constructivist learning.

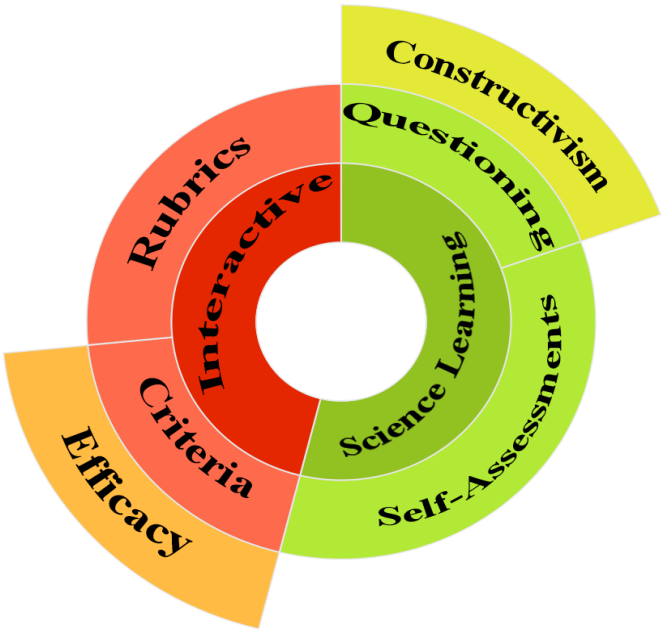

Figure 4. Social environment

Attitudinal data indicates a number of influences concerning the types of social interactions that occurred during science learning that rendered the development of social capital (Figure 5). Students and parents believed a sense of relational reciprocity was prevalent during social interactions, which resulted in motivation and ownership of interactions. Students also developed a sense of self-responsibility, which resulted in feelings of success. Both parent and student data indicated the development of a holistic mindset that resulted in self-evaluation of academic and social performance with a sense of achievement.

Teachers indicated the researcher's development and employment of professional erudition was highly supportive. Teachers felt they developed new skills, which further provided the formation of improved collaborative and communicative skills.

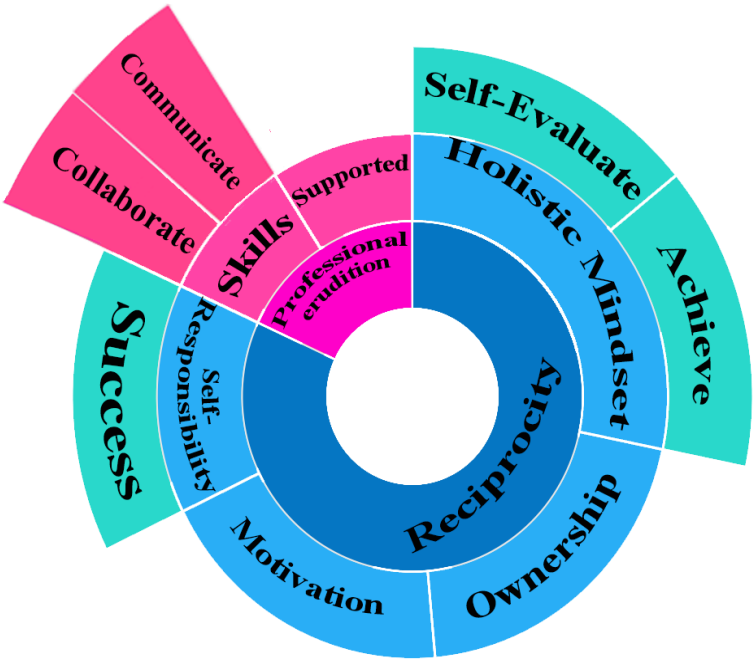

Figure 5. Social perceptions

Data illustrated a community of practice was forged as a result of the formation of a student-parent-teacher participatory partnership (Figure 6). The study's participants felt their partnership was genuine, which resulted in motivation. As a result of social norms development, students and parents perceived self-reflections as inspiring, which created students feeling socially supported. Students and parents also perceived their lived experiences as enjoyable, with journaling being an influencing factor. As a result of their mutual experiences and analysis of attitudinal data, their interactions resulted in positive social change for learning.

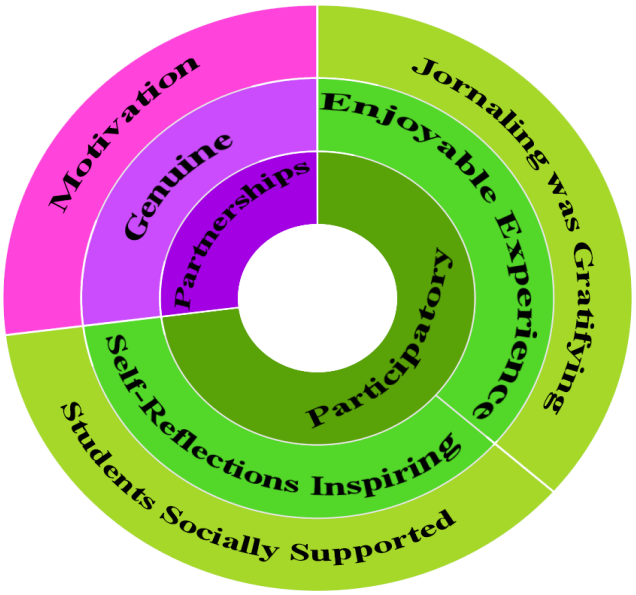

Figure 6. Social change

Recommendations

Much like the philosophical construct of STEAM, teaching and learning is a blending of desired outcomes that not only include cognitive, academic achievement, but also comprise the primary success of social skills development. There is an art in delivering meaningful teaching and learning, as there is a science in establishing an atmosphere conducive to supporting meaningful teaching and learning. Employing this conceptualization, if the artist's canvas is professional erudition, each brushstroke first applies layers of social supports followed by painted layers of academics for a portrait of learning. The thoughts, perceptions, and acuities of students, parents, and teachers paint a portrait of the conditions for developing a communal practice for learning. While there are many factors that influence a decline of interactive participation between the home and high school, and in particular, science, there are also authentic strategies that can be employed to facilitate social change and apply paint upon the canvas, one brushstroke at a time.

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Author Information

Christopher Dignam
https://orcid.org/0009-0007-3185-4825
Governors State University
1 University Pkwy
University Park, Illinois 60484
United States

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Stakeholders' Perceptions on Adoption of Blended Learning Approach in Tanzanian Secondary Schools

Haruni Machumu
Mzumbe University, Tanzania

Tusekilege Mwamkinga
Mzumbe University, Tanzania

Abdallah Jacob Seni
University of Dodoma, Tanzania

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Abstract

Integrating information communication technologies in education goes with many digital learning applications. Blended learning Approach (BLA) has been an important strategy that facilitates students' learning. This study investigated stakeholders' perceptions on the adoption of a blended learning approach (BLA) in Tanzanian secondary schools. Specifically, the study identifies stakeholders' perception on the adoption of BLA in secondary schools, examines the learning environments that support the adoption of BLA in Tanzanian secondary schools and assesses the extent to which the BLA is used in secondary schools. Data were collected via self-administered questionnaire and interviews; the response of 620 participants were analysed. The results showed that participants adequately had confident perception towards the adoption of BLA on students' learning; further, in the studied schools, learning environments were perceived to be supportive in the adoptions of BLA based on available devices and services; this will, later, positively facilitate the adoption and influence the increase of level of BLA usage among teachers and students. However, poor infrastructure, lack of institutional support and insufficient hardware and software facilities impinged the use of BLA. In conclusion, BLA is well perceived; thus, the resolution to the challenges would promote its application in the classroom.

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Corresponding Author: Haruni Machumu, hmachumu@mzumbe.ac.tz

Introduction

Learning technologies are the whole shebang in modernised education systems, which are claimed to provide students with the most labour needed in 21st-century job skills. Schools and companies struggle to adopt user-friendly, supportive, communicative, individual-owned, accessible and flexible learning approaches (Topping et al., 2021; Rao, 2018; Siew-Eng & Muuk, 2015). As such, in both the teaching and working worlds, the blended learning approach (BLA) is a promising strategy, and it seems that society is expecting it as it looks at digital learning and working capacities. Typically, BLA encompasses collaborative platforms, webinars, interactive audio-visual, and online learning coupled with face-to-face interaction to support student learning (Tan et al., 2021; Ustun, 2019). According to van Laer and Elen (2018), blended learning is distinguished by the intention to use online and classroom-based interventions to initiate and support teaching and learning; foster socio-constructivism, reflective thinking, and inquiry practices (Villanueva et al., 2023). However, it is also the case that one definition is yet to be achieved (Graham, 2013); application of blended learning in developing countries like Tanzania is influenced by increased comprehensive adoption of innovative learning technologies, internet use, computer and digital skills (Malima et al., 2023). Therefore, blended learning is widely accepted and adopted approach delivery of education (ElSayad, 2023; Tang et al., 2024).

As it stands, blended learning refers to the use of computer-assisted learning combined with contact moments whereby interaction between students, teachers, internet-based devices, and learning management systems influence active teaching and learning (Machumu et al., 2022). As claimed by Siew-Eng and Muuk's (2015) study, blended learning exposes students and teachers to the outer and higher horizons, which are far beyond the traditional hook of the book-teacher model where learning should be necessarily limited to the classroom. This entails that BLA is much more flexible in representing content by using different methodological approaches, strategies and styles which can enhance learning. Empirical evidence unveils that due to its effectiveness, and flexibility; schools in different countries have adopted and integrated BLA in their curricula as one of influential and innovative pedagogies in teaching and learning process (Bhatt et al., 2021; Lapitan et al., 2021; Tan et al., 2022; ElSayad, 2023; Egara & Mosimege, 2024). As such, countries like the USA, China, Chile and Malaysia have adopted the model and integrated it into the education curriculum for lower schools (UNICEF, 2020; Bhatt et al., 2021; Liu et al., 2024; Hayati et al., 2021; Yu et al., 2023).

In Malaysia, for instance, teachers are provided with many new technologies that are believed to be able to help them perform their jobs better (Yarborough, 2012; Villanueva et al., 2023. Over the past two decades, the government has invested millions of dollars in equipping all 10,000 schools with not only computer labs but also the Frog Virtual Learning Environment (Frog VLE) (Bushko, 2017). The Frog VLE is a web-based learning system that replicates real life learning by incorporating virtual equivalents of traditional concepts of

education (Kamalludeen et al., 2016; Majid & Hasim, 2019). Malaysia puts attention on e-learning in schools as a segment of the government's vision for 2020 (Yarborough, 2021; Siew-Eng & Muuk, 2015). The analysis of Malaysian teachers was able to integrate e-learning into their teaching practices (Tan et al., 2022). The Frog VLE also caters searchable lecture materials, forums, streamed video and assessment as learning and teaching resource (Majid &Hasim, 2019).

In Tanzania, SEDP (2004-2009) emphasised ICT-based information management in primary, secondary and teacher training colleges (URT, 2007). The development of the Information Communication Technology (ICT) policy for basic education facilitated the integration of curriculum and content in the modern pedagogy of teaching and learning. The general role of these policy frameworks acknowledged the use of ICT devices in education in order to improve the quality of education and helped to raise awareness of the benefits and the potential gains in adopting ICT in the education sector, which, in turn, raised ICT to priority area in education planning (Liu et al., 2024). Despite the impressive policy statement, its implementation is far behind the reach of the policy target. It was expected that the application of blended learning would have spread all over the country but that is not the case.

Empirical evidence shows that the level of teachers applying ICTs in secondary school was too minimal to facilitate the integration of traditional methods and ICTs in classroom teaching (Almerich et al., 2014). The ability of teachers to practice pedagogical ICTs such as BLA, online learning and e-learning is highly influenced by the knowledge, competences and skills possessed. As such, the deployment of ICTs and BLA knowledge in secondary schools in Tanzania was not fully realised (Kihoza et al., 2016). There are no sufficient reasons that are brought forth to explain about observed findings. Significantly, the study observed that if the BLA is the current ideal delivery mode of teaching and learning that secondary schools should adopt, then, the need to uncover the unknown reasons for poor utilisation of BLA in secondary schools is highly demanded. Consequently, this study investigates stakeholders' perceptions on the adoption of BLA in Tanzanian secondary schools. Studies have shown that integration of BLA, in the education system, is an effective approach to dispensing knowledge and learning innovation to students and teachers (Eggers et al., 2021; Iringan, 2020).

However, cognisant of the importance of adopting ICT in the education system, the government of the United Republic of Tanzania deliberately integrated the content of the curriculum in primary and secondary schools with that of ICTs (Ministry of Education, Science and Technology (MoEST), 2023). The need was to ensure that students are taught about the application of ICT facilities and make ICT an instrumental component of the teaching and learning process in a blended form (MoEST, 2023; URT, 2007; Almerich et al., 2014). Furthermore, the policy decisions that the government undertook did not seem to actualize since many secondary school teachers are still attached to the use of traditional methods of teaching (Machumu & Zhu,

2019). Blended learning is still regarded as a new approach by most teachers and students in schools, meaning that the policy statement is in contradiction to the observed practices. It is high time for the studies to find out the reasons causing the observed mismatch between the policy and practices.

Literature Review

Blended Learning and Blended Learning Environments

History has it that BLA was first introduced in the field of corporate human resources training, aiming to overcome the limitations of time and space in face-to-face teaching, including small class size, poor timeliness, and high training cost (Liu et al, 2024). Garrison and Kanuka (2004) view blended learning as an integration of old face-to-face classroom experience and online learning experience. Blended learning takes several contexts of learning approaches that provide a learner and a teacher with the potential possibility to learn and teach effectively via innovative learning technologies. In this study, blended learning refers to a combination of conventional face-to-face methods and ICT to form an integrated instructional approach. This combination inspires students to engage themselves in active and collaborative learning. In BLA, online teaching and learning encourage the sharing of experiences among students; thus, improving learning and digital skills. Also, the application of BLA is designed to attain several learning goals: student-centred education; students' experience using innovative learning technologies, tools and devices; blended learning helps students to practice life skills (Dangwal & Lalima, 2017; Shivam & Singh, 2015). In fact, BLA in Tanzanian context refers to an approach to education that combines online educational resources and opportunities for online interaction with traditional face-to-face teaching and learning.

In connection to BLA, as described above, blended learning environments have been referred to as the pedagogical combination of both the effectiveness of face-to-face teaching environments and ICT-mediated teaching and learning environments (Iringan, 2021; Hayati et al., 2021; Graham & Allen, 2009). Graham (2013) suggested the following essential features of blended learning environments: increased student engagement in learning, students feeling safe with personalised learning, collaboration tools like social media communication, enhanced teacher and student interaction, social learning support, responsibility for learning and time management. In addition, other crucial features include improved students' learning outcomes, time flexibility, enhanced institutional reputation and 24/7 access to training resources, tracking employee performance and skill development, reduction in training costs and provision of personalized training experiences. In Tanzanian context, blended learning environment refers to learning situations integrating the advantages of the online learning delivery and face-to-face delivery modes. In other words, blended learning environments use both traditional approach and modern learning technologies to collect, store and organize learning resources in

digital forms of all kinds—data, text, images, motion video, sound, and integrated media—and made it available and sharable for teaching and learning (Machumu et al., 2022).

Conditions for the Adoption of BLA in the Context of Tanzanian Secondary Schools

The adoption of BL in secondary schools is a challenging activity since it demands some basic preparations in the aspect of the teaching and learning process, students, content design and the infrastructures (Yu et al., 2023; Villanueva et al., 2023; Eggers et al., 2021; Dangwal & Lalima, 2017). The following are necessary conditions in the adoption of BLA: Blended learning demands well-trained teachers who could emphasise the student-centred approach of teaching and learning perspective (Iringan, 2021). The teachers need to be familiar with the BLA and have the skills to blend both traditional face-to-face and online teaching and learning delivery. Moreover, teachers need to be trained to develop content in digital form so that it can be available to students. Teachers should know how to use learning technologies including websites, blogs, YouTube facilities, and software like Skype, Google Talk and social networking sites for educational purposes (Malima et al., 2023).

Teachers engaging in BLA should have a scientific attitude to adopt diverse learning technologies relevant to BL implementation in secondary schools (Apandi & Raman, 2020; Farrely & Shand, 2017). Thus, to adopt a BLA, there is a need for flexibility in other aspects of learning such as learning timetable, delivery methods, assessments, and examination system. These aspects are crucial for the adoption of BLA not only in secondary education but also in higher education (Warioba et al., 2022). Scholars revealed that possible conditions for adoption of BLA in schools include ICTs infrastructures, good classrooms, well-furnished computer laboratories with enough computers to satisfy all the students of one class and lastly the internet facility and its accessibility (Caporarello & Iñesta, 2016; Warioba et al., 2022). As discussed in Dangwal and Lalima's (2017) study, continuous internal assessment and other tools for formative evaluation should be able to provide the need required for the adoption of the BLA in terms of facilities and infrastructures. Parents and guardians based on their roles as essential education stakeholders; need to be aware of a BLA. They need to support their children so that they can be ready to adopt BLA for the benefit of their children's academic progress (Tan et al., 2021).

Uses of BLA in Teaching and Learning in Tanzanian Secondary Schools

Teachers in secondary schools use BL to maximise the benefits of traditional face-to-face learning and online learning (Tang et al., 2024; Tan et al., 2022; Wang et al., 2009). Studies show that secondary school teachers use BLA to create the best learning environment for their students and that they blend different methodologies, and approaches to develop the most efficient learning environment (Topping et al., 2022). Secondly, BLA has

been used to support a student-centred learning environment that motivates active and deep learning in students (Vernadikis et al., 2011; Rao, 2018). When student-centred learning is practised in a blended learning environment, instructions have to be provided through the online learning environment (Iringan, 2021). The role of the teacher in a BLA changed to a facilitator as opposed to a sage on stage (Apandi & Raman, 2020).

Thus, instructions to be provided through online, learning activities and other resources should be carefully selected and designed to support both face-to-face as well as online learning (Weerasinghe, 2018). Thirdly, BLA supports the accessibility of materials such as textbooks, and students' notes. Also, through BLA, learning materials are made available in electronic handheld devices such as mobile phones, laptops, tablets, and e-readers (Liu et al., 2024). Fourthly, BLA is used to support the traditional face-to-face teaching approach (Eggers et al., 2021; Fernando, 2020). As claimed by Garrison and Kanuka (2004), the real test of BLA is the effective integration of two main components: face-to-face and computer-mediated learning instruction such that it is not just adding on to the existing dominant method. However, BLA integrates several resources, methods, activities, devices, and approaches related to teaching and learning to enhance accomplishment of learning outcomes. Fifthly, BLA creates motivating learning environments (Egara & Mosimege, 2024; Eggers et al., 2021). BLA can provide students with the option to select the type of learning environment that best meets their learning and scheduling needs.

BLA Experience during and after the COVID-19 in Tanzania Secondary Schools

According to the World Health Organisation (WHO), the Wuhan Municipal Health Commission in China reported several cases of pneumonia illness on December 31, 2019, which erupted and caused health respiratory complications. Owing to similarities with the coronaviruses that cause the Middle East respiratory syndrome (MERS) and severe acute respiratory syndrome (SARS), it was later dubbed coronavirus disease (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (WHO, 2020b). Outside of China, COVID-19 started spreading too quickly, and as of 13th January 2020, Thailand reported a similar case of COVID-19 (WHO, 2020a).

Apart from the health sector, other sectors like education experienced the COVID-19 tremble, as schools, colleges and universities were closed (Msigwa, 2020; UNESCO, 2020a). In line with the COVID-19 challenge, mechanisms were devised to allow the provision of education in distance mode (UNICEF, 2020; UNESCO, 2020b). As such, online and blended learning becomes a central focus in some countries with state-of-the-art technologies like the availability of home internet systems, learning management systems, and teaching and learning devices like laptops, tablets, iPads, and Kindle (Lapitan et al., 2021; Namulondo et al., 2023). Other countries opted to go back to traditional distance learning mode through radio programmes and television

sessions for lesson delivery (UNESCO, 2020a). Like other countries, in Tanzania, the closure of schools, colleges and universities forced fundamental changes in the teaching and learning process. Msigwa (2020) unveil that during COVID-19, the government of Tanzania devised different mechanisms including mode of delivery, assessment methods, teaching and learning activities as well as school governance. On the one hand, with curfews, physical distancing guidelines, routine screening, contact tracing, self-isolate, mask-wearing, open door policy, furlough, and quarantine policies, the government sought to keep providing education to learners in their homes and protecting teachers and workers gradually (WHO & ILO, 2021).

On the other hand, post-COVID-19 events demonstrate that BLA has continued, with the following happening since COVID-19: (i) The use of e-learning platforms, blogs, and websites in teaching and learning have increased (Msigwa, 2020; Malima et al., 2023). Examples of these platforms are: https://www.msomeni.co.tz/; https://somaconect.or.tz/; https://www.onlineschoolbase.com/; https://www.darasahuru.co.tz/; https://www.shuledirect.co.tz/; https://somakwanza.tz/); (ii) online libraries such as google classroom and Tie Library (use of mobile apps) to disseminate teaching and learning resources including video and e-books (https://ol.tie.go.tz/); (iii) tutoring through direct phone-based text and SMS has increased since COVID-19 (Msigwa, 2020); (iv) use of social media like Facebook in the classroom and What Apps groups which brings together teachers and students for sharing. Teachers use these social media platforms to distribute homework packages and require parents to urge their children to participate in assignments (v) radio programmes and television episodes; however, it is rarely used after COVID-19, still, some schools recommend their students to follow subjects' specific radio and television programmes in various TV channel and radios (Malima et al., 2023). With confidence, we refer to these experiences as "inclusive excellence" since they provide real, concrete, and observable insights into the effectiveness of BLA adoption and implementation in both normal and tragic life situations. Given the BLA experiences during and after COVID-19, the current study explores stakeholders' perceptions on the adoption of BLA in Tanzania secondary schools.

Theory Bases

The current study adopted the Concerns-Based Adoption Model (C-BAM) since changing teaching methods, pedagogical tools, concerns and learning approaches by integrating learning technology is a way to enhance the 21st-century lives of both students and teachers (Machumu et al., 2022; Almerich et al., 2016). The C-BAM denotes a developmental process for accepting innovations in education, concentrating on individuals' enhanced use and experiences like the use of ICT to improve students' and teachers' learning (Garrison, 2021). As such, improved use of learning technologies in secondary schools is enhanced by teachers' strategies, learning environments, facilities, ICT services and school actions to adopt change.

In the 1970s, the Research and Development Center for Teacher Education created the C-BAM (McREL.org, 2021; Hall & Hord, 2020). According to Khoboli and O'Toole (2012), the work of Frances Fuller served as the foundation for the first iteration of the C-BAM model. Additionally, the model takes advantage of teachers' worries about improving their teaching talents and capacity to improve student learning. The literature claims that twelve assumptions (principles of change) form the basis of C-BAM (Donovan et al., 2007; Khoboli & O'Toole, 2012; Hosman & Cvetanoska, 2013):

(1) change is learning; it's as simple and complex as that; (2) change is a process, not an event; (3) implementing change is a whole system effort; (4) organizations adopt change while individuals implement change; (5) The school is the primary organizational unit for change; (6) school-based leadership is essential to long-term change success; (7) facilitating change is a team effort; (8) interventions are key to the success of the change process; (9) appropriate interventions can reduce resistance to change; (10) all-way communication is needed all the time; (11) mandates can work; and (12) sustaining change requires additional time, interventions and leadership."

The C-BAM model has increasingly been used in recent years to examine the use of computers in schools (McREL.org, 2021), specifically to address concerns like the efficiency of directed technological interventions and adoption. As claimed by de Vocht & Laherto (2017), the initial spreading in a successful adoption process is quick among early adopters or forerunners and slows down once a majority has adopted the innovation. The C-BAM consists of three distinct components: levels of use, innovative configurations, and stages of worry (Fuller, 1969, as in Hall & Hord, 2020). The stages of the concern process are designed to support and understand the range of excitement, perceptions, and emotions that teachers experience regarding a specific change (e.g., ICT integration, and teaching methods) (Hosman & Cvetanoska, 2013). It should be noted that teachers are often confronted with new curricula and other modifications to the execution of school programmes and routines daily. Moreover, the C-BAM, as a theory to promote change, is therefore appropriate to analyse the process of teachers' adapting to and adopting technology vis-à-vis their teaching and learning skills, experiences and demands for professional development.

Besides, the C-BAM is adopted in this study since it specifically focusses on stakeholders' perceptions of the adoption of a blended learning approach in secondary schools because stakeholders like teachers are at the core of the change process. As a result, it also provides a useful framework not only for examining learning environments for the adoption of blended learning but also for studying experiences and skills in the use of the blended learning approach. Although C-BAM has been used in a wide variety of educational settings, it was developed and researched primarily within pre-primary, primary and secondary education settings. Its applicability to secondary schools may be limited by two core assumptions: First, C-BAM assumes that the

innovation will be adopted. Second, its emphasis on implementing new teaching and learning approaches (cf., blended learning) with fidelity, may not adequately address the complexity of change in secondary schools (Kihoza et al., 2016; Villanueva, et al., 2023).

However, each of these factors may not apply during COVID-19, because the switch to ICT and related innovation like BLA, e-learning, microlearning and online instruction is not something teachers and students decide about; they rather implement them since they require guidance, funds and technical support from experts and institutions (de Vocht & Laherto, 2017). In addition, ICT use, BLA, e-learning adoption and online instruction require a countless level of commitment in ICT use. In this study, the C-BAM explains how stakeholders in secondary schools and teachers adopt and facilitate change that helps students understand, adopt, lead, learn and monitor the complex process of change in education by using ICT as a complex innovation that requires multifaceted design and training to implement. Furthermore, the model should consider the specific concerns of teachers and secondary school administrators who are being directed and required to make the necessary changes in order to use innovative learning technologies such as e-learning, BLA and online learning.

The interest of the study was to probe the stakeholders' perceptions on the adoption of a blended learning approach in Tanzanian secondary schools. To achieve this objective, the study was guided by the following research questions:

1. What are stakeholders' perceptions about the adoption of a blended learning approach in secondary schools in Tanzania?
2. How do school learning environments support the adoption of a blended learning approach in secondary schools in Tanzania?
3. To what extent is the blended learning approach used in secondary schools in Tanzania?

Methods

The study employed exploratory sequential design. It is a two-phase mixed methods research design which often requires the qualitative phase to have a bigger priority than quantitative strand due to the research problem and purpose of the study. The study employed two-phase mixed methods research with a constructivist ontological premise. The premise concerns the social construction of reality. The choice of design was based on two aspects: research objectives and the fact that researchers wanted to familiarize themselves with the topic as it is used in the study context. The results of the qualitative component aided the research in developing a questionnaire to collect quantitative data. The findings were merged at the interpretation stage of the study.

Population and Sampling

Twelve secondary schools and districts education departments from four regions (cf., Morogoro, Dar Es Salaam, Dodoma, and Iringa) in Tanzania were selected to inform the study. The selection of regions and schools were based on the following attributes: availability of power at the school, conditions for adoption of BLA approach, the internet, computer labs, ICT help desk, familiarity, and proximity of study areas to researchers' workspaces. At the time of study, the population of the study was based on 12 secondary schools with estimated 1214 population. The sample includes heads of schools, deputy heads of schools, teachers, and students. The study also involved education quality assurers and secondary educational officers. A sample of 620 respondents was used to inform the study. The study used a stratified random sampling technique to obtain 60 teachers and 480 students. In addition, a purposive sampling technique was employed to select 12 heads of schools and 12 deputy head of schools, 12 ICT teachers, 12 school academic officers, 16 school quality assurers and 16 secondary school educational officers.

Table 1. Categories of participants, study locations and number of secondary schools

Categories of respondents	**Regions**												**Total**
	Morogoro			**Dar Es Salaam**			**Iringa**			**Dodoma**			
Schools	SS1	SS2	SS3	SS4	SS5	SS6	SS7	SS8	SS9	SS10	SSS11	SS12	
HoSs	1	1	1	1	1	1	1	1	1	1	1	1	12
DoHs	1	1	1	1	1	1	1	1	1	1	1	1	12
SAOs	1	1	1	1	1	1	1	1	1	1	1	1	12
ICT-T	1	1	1	1	1	1	1	1	1	1	1	1	12
QAO	2	1	1	2	1	1	1	2	1	1	2	1	16
SEO	2	1	1	2	1	1	1	2	1	1	2	1	16
Teachers	5	5	5	5	5	5	5	5	5	5	5	5	60
Students	40	40	40	40	40	40	40	40	40	40	40	40	480
Total	53	51	51	53	51	51	51	53	51	51	53	51	620

Key: SS = Secondary school; DH = Deputy head; SEO = Secondary Education Officers; QAOs = Quality Assurance officers; SAOs = school academic officers; ICT-T = ICT teacher

Instruments

This study used several data collection techniques including questionnaires and interview guides to obtain essential data. The questionnaire was divided into two sections: the first section involved demographic questions such as gender, age, educational level, work experience, and subject. The second section addressed variables items related to stakeholders' perceptions about the adoption of BLA, supportive learning environments for adoption of BLA and the magnitude of BLA usage. To achieve validity, the study employed triangulation and back translation. Triangulation by using questionnaire and interview methods was employed on heads of schools, educational officers and education quality assurers, teachers, and students. Triangulation was used to ensure the complementarity of data gathered for the study. Further, participants used the Kiswahili

and English language interchangeably; therefore, some questionnaires and interview guides in the English language were translated into Kiswahili language for some participants to help participants understand. Then, the responses were back translated into the English language. The study performed a pilot study in 12 secondary schools with the same characteristics as that of the expected actual study areas. Moreover, before data collection, the study considered ethical issues for effective research conduct. The researchers sought for permission letters from several authorities at school level. In this study, informed consent was obtained from the study participants who were informed in advance about the significance of the study, data and analysis procedures, risks, benefits and their right to withdraw at any time. They were assured that their privacy and confidentiality are protected.

Data Analysis

Analysis of qualitative data was done by using content analysis. In the course of facilitating the analysis, the collected data were prepared through coding and editing. The interview method provided massive information that was necessary to be subjected to procedures of data management, reduction and construction of themes related to the research questions. The coding process started after the text had been transcribed, translated, and put into the Word documents. The matrix technique was used to create categories of concepts, and meanings and find the similarity between respondents' opinions. The processes involved iterative and intensive reading of the narrative text from every respondent. Collected quantitative data were cleaned up, summarized and then coded before they were taken into the IBM SPSS Statistics 26 for descriptive analysis. Descriptive analysed data were presented in tables, frequency and percentages.

Results

Stakeholders' Perception on the adoption of BLA

Researchers sought to establish secondary school stakeholders' perceptions on the adoption of BLA. Perceptions of respondents were measured through two aspects including the understanding of the concept "BLA" and perception towards the practice of the BLA in the studied secondary schools. Researchers used interviews and questionnaires to generate relevant information. The first interviewees were the school quality assurance officers who were asked to provide the understanding meaning of the BLA, their responses are provided in extracts hereunder:

"*BLA is the opportunity for a student to learn in different environments be in class or out of the classroom whereby he/she may utilise different technologies such as ICT to access learning content (SQA, 14/05/2022 13:00 hrs*."

In congruence, when asked about his perceptions towards the adoption and practice of BLA in secondary schools, taking into consideration of resources (i.e., internet, devices and electricity) constraints, some of school quality assurance officers had the following to offer:

"*In our context [Tanzania], teaching and learning depend on physical classroom attendance, of which teachers are responsible to be in class on daily basis, I thought BLA can be positively endorsed, recognised and guarantee since using offline digital content is a milestone to both students and teachers … meanwhile it makes the process of learning more accessible and convenient (SS1_SQA, 12/09/2021 09:30 hrs.)*".

On the other hand, teachers were not very far from school quality assurance officers' understanding about BLA. Teachers appeared to be knowledgeable about BLA as they were able to offer several conceptual meanings. For example, one of the teachers from SS5 argued that:

"*To my understanding BLA is an approach used in teaching and learning by the use of computers… it encourages the use of both personal and group learning through assistive technologies…the technology things, the internet, gamification, learning platform, social media, and mobile learning combined together (SS5_teacher, 15/05/2021 09:30 hrs.)*".

Another teacher had the following to add:

"*I have attended several training and workshop on the use of digital learning content and online learning platform… as a result, I can say that BLA is good to me and when used appropriately can provide better-quality integrated learning environment to both teachers and students (SS7_teacher, 16/05/2020 12:00 hrs.)*"

Similarly, interviewees from SS1 conceived BLA as an embedment of traditional and modern technology. They argued that during the peak of COVID-19 in the country, schools were in a cessation situation, and were encouraged to use several measures in preparation for normality of teaching and learning. It was during that time some of the teachers in studied secondary schools heard about BLA. In support of that, one of the interviewed teachers emphasised that:

"*The BLA is a technique of combining the traditional method and the new technologies using the internet and computer-connected devices that help students to gain more materials as they prefer (SS11_teacher, 08/05/2021 12:00 hrs.)*"

In the other interview, a deputy head of the school showed interest in the adoption of BLA by arguing that BLA is a good approach for both students and teachers, however, in the context of poor resources lamented that:

"*BLA is a good approach to enhance students personalised learning …however, we still have as many as possible challenges including lack of internet connectivity and learning devices among our students (SS8_teacher, 17/05/2022 12:00 hrs.)*"

On their side, students described blended learning as:

"*To me, BLA is the means used in teaching using electronic devices such as computers, projectors and the like but also other old methods are applied in mixed ways (SS4_Student, 10/05/2022 14: 15 hrs.)*"

Data from the interviews show that respondents had a basic understanding of the BLA. The concept of BLA was understood as the method of using ICT in combination with traditional methods for the teaching and learning process and it can take place inside or outside the classroom. Also, a questionnaire was used to obtain information from respondents regarding their awareness of BLA. Two questions were posed to measure the understanding and awareness of respondents about the BLA. The responses are indicated in Table 2.

Table 2. Respondents Awareness with BLA

Respondents	**Variable**		
	Are you aware with BLA at this school(s)		
	Response		
	YES (F/%)	**NO (F/%)**	**F/%**
Teachers	45 (75)	15 (25)	60 (100)
Students	349 (72.7)	131 (27.3)	480 (100)
ICT-T	10 (83.3)	2 (16.7)	12 (100)
QAQs	9 (75)	3 (25)	16 (100)
HoSs	10 (83.3)	2 (16.7)	12 (100)
SAOs	9 (75)	3 (25)	16 (100)
DoSs	10 (83.3)	2 (16.7)	12 (100)

The findings in Table 2 revealed that 72.7% of the students were aware of the concept of BLA as opposed to 75% of the teachers. While ICT-T got 83.3%, QAO 75%, HoSs and DoSs 83.3 % were the same. These findings, perhaps, report that almost all students are cognizant with BLA uses in their respective secondary schools. In doing so, respondents were asked to indicate their understanding of BLA. The descriptive responses are provided in Table 3.

Table 3 shows that respondents have good theoretical knowledge of BLA. While about 90.9% of respondents (students) understood BLA as the learning system by use of ICT sources like computers, TV, the Internet, learning systems, laptops and tablets; other respondents who composed 89% (of teachers) indicated that BLA as an approach used in teaching and learning through a combination of various technology and traditional methods such as the use of computer, slides and other ICT facilities. However, the data presented imply that teachers were more knowledgeable about BLA than students. Categorically, the findings indicate that participants had a high theoretical understanding of the concept of BLA. This was an impressive observation since it provides ground to dig further into the nexus of theory and practice.

Table 3. Teachers and Students Understanding of BLA

Defining BLA	Students	Teachers	QAQs	HoSs	SAOs
	F (%)	F (%)	F (%)	F (%)	F (%)
Learning by using other sources like computers, social media, TV, learning systems, laptops, and tablets not only from book sources	350(72.9%)	11 (18.3%)	3 (25%)	2(16.7%)	2(16.7%)
Use of cutting-edge learning technology alongside conventional delivery methods.	10(2.0%)	20(33.3%)	2(16.7%)	3 (25%)	2(16.7%)
Integration of online learning and several traditional teaching methods	50(10.4%)	13(21.7%)	3(25%)	1(8.3%)	2(16.7%)
Access to a broad range of learning modes and methods.	50(10.4%)	10(16.7%)	2(16.7%)	2(16.7%)	2(16.7%)
The approach of teaching students that combines face-to-face instruction with online learning.	13(2.7%)	5(8.3%)	1(8.3%)	3 (25%)	4(33.3%)
I have no idea about BLA	10(4.8%)	1(6.7%)	1(8.3%)	1(8.3%)	0 (0%)
Total	480(100%)	60(100%)	12 (100)	12 (100)	12 (100)

School Learning Environments and the Adoption of BLA in Secondary Schools

The study explored secondary school environment learning factors possibly available to support the adoption of BLA. The presence of computer experts who could collaborate with teachers while implementing BLA was one of the factors under examination. Interviews were conducted to students, heads of schools, and teachers to establish if school learning environments in studied schools could support the adoption of BLA. The following extracts generated from students and teachers during the interviews are presented in Table 4:

Table 4. Students' Responses about School Learning Environment in Support of BLA Adoption

Extracts	Sub-themes	Themes
We refer to one of our teachers as "mtaalam wa komputa" meaning that a computer expert since he/she has been teaching us computer studies since 2021 (SS1_student_10/05/2020, 12:00hrs_Morogoro)	Computer expert, ICT teacher,	ICT teacher
We have good computers in our computer room…the room is furnished with carpet, air-condition, electrical energy, 50 desktops (SS2_student 15/05/2020, 14:15hrs_Morogoro)	Computer lab, electrical energy Compute class	Computer lab, electricity energy
In this schools, we enjoy computer class with our ICT teachers who has been a blessing to us. We learn typing skills, searching, and googling (SS4_student_06/09/2021, 08:20hrs_Iringa)	ICT teachers, Computer class, ICT basic skills	ICT teacher, computer class
I have seen another computer expert from nearby Catholic-owned schools who visit the school premises to lecture us about computer and related skills (SS9_student 20/09/2021, 09:30hrs_Iringa)	Computer experts, using computer, searching	Computer experts, computer class
I have noticed that there is a man out of the school who comes to handle the situation technical issues in the computer room, maybe he is a computer expert of our school (SS11_student, 22/09/2022,12:00hrs_Dar)	Hired experts, ICT teachers,	Hired computer experts, ICT teacher

However, I once observed a person visiting our school to fix the internet connections and explaining some issues to our teachers while in class (SS12_student_20/09/2022, 10:06hrs_Dar)	Computer labs, Hired computer experts	Computer labs
Sometimes desktops are connected to the internet for internet surfing skills during class hours (SS3_student 16/05/2020, 14:15hrs_Dodoma)	Internet, desktops	Internet
Almost all our teachers possess smartphones while our ICT teachers have laptop, smartphones, and desktops at his office (SS10_student 16/05/2020, 14:15hrs_Dodoma)	ICT devices smartphones	ICT devices

It seems that computer class, computer experts, ICT teachers, computer devices, and electricity energy are possible perceived parts of school environments for adoption of BLA in studied secondary schools. Aso, it was revealed that some studied secondary schools do not have computer experts who can assist with maintenance and technical issues regarding computer system breakdown and software update. Moreover, the descriptive statistical results in Table 3 and 4 were congruent with the explanations provided by the heads of schools concerning the application of the BLA. Extracts are presented in Table 4 hereunder.

Table 5. Head of Schools' Responses about School Learning Environment in Support of BLA Adoption

Extracts	**Sub-themes**	**Themes**
In this school, some informed teachers use LCD projector for teaching and learning. LCD projector has been digitally used in connection to the online recorded lecture from the internet as a teaching to showcase advanced learning experiences SS1_HoS, 19/05/2020,14:45hrs.)	LCD project, online recorded lecture, digital tools	Digital learning tools
The school received internet facilities from the Mobile Internet Service Provider (ISP) for free to augment teaching and learning process (SS4_HoS, 14/07/2021,14:45hrs.)	Internet facilities, Internet services	Internet
In fact, teachers try to adopt current technological teaching devices and e-resources which support adoption BLA in their lessons. (SS6_HoS, 19/09/2022,14:45hrs.)	Technological teaching devices, e-resources	Digital tools
At this school, we have computer lab that accommodate 50 students at per learning session. (SS8_HoS, 15/10/2023,14:45hrs.)	Computer lab	Digital tools
With some digital tools like video, websites, e-resources at our schools, BLA adoption is possible pedagogical approach. (SS3_HoS, 09/09/2022,14:45hrs.)	Websites, video, e-resources	Digital tools
Video is one of digital tools for classroom that are used by both teachers and students for educational purposes in school (SS5_HoS, 22/10/2022,14:45hrs.)	Digital tools, video	Digital tools
I thought that the use of digital tools boost students' engagement and enhance learning experiences in an overcrowded classes (SS12_HoS, 12/10/2022,14:45hrs.)	Digital tools, engagement, learning experiences	Digital tools
Some teachers create multimedia posters by combining text information, photos, and videos and they use it on various subjects and topics for teaching (SS9_HoS, 23/08/2023,14:45hrs.)	Multimedia, photos, video and poster	Digital tools

The results presented in Table 4 and 5 reveal three outstanding findings. First, for interviewed students admitted that schools used to hire external ICT experts in case of need of computer class. Second, it was revealed that some teachers acted as IT experts but were not fully employed for that purpose. Third, interviewed heads of schools appeared to be conversant with the school learning environments they lead since the majority praised their teachers who used several digital tools for educational purposes. This study assessed the school learning environments that are supportive to the adoption of BLA. Furthermore, students and teachers were assessed on

the school learning environments focused on nine instrumental aspects. A summary of the results is presented in Table 6.

Table 6. School Learning Environments Supporting BLA Adoption

Item (school learning environments)	Rating Scale (1-2)			
	Students		Teachers	
	Agree	Disagree	Agree	Disagree
	F (%)	F (%)	F (%)	F (%)
ICT infrastructures computer lab	400(83.3)	80 (16.7)	47 (78.3)	13(21.7)
Availability of electricity i.e., lighting	411(85.6)	69(14.4)	41(68.3)	19(31.7)
Availability of ICT teacher at school	430(89.6)	50(10.4)	55(91.7)	5(8.3)
School ICT facilities & services	301(62.7)	179(37.3)	35(33.3)	25(41.7)
Recommended academic websites i.e., ShuleDirect, TIE, Khan Academy database	303(63.1)	177(36.9)	49(81.7)	11(18.3)
FQAs leaflet about BLA	114(23.7)	366(76.3)	23(38.3)	37(61.7)
School IT technicians for technical support	130(27.1)	350(72.9)	15(23.3)	46(76.7)
The school ICT team with the Help Desk	125(26.1)	355(73.9)	19(31.7)	41(68.3)
Wireless equipment - wireless access points (WAPs) i.e., Tigo, Airtel	85(17.7)	395(82.3)	11(18.3)	49 (81.7)
Approachability of ICT teacher for assistance	353(73.5)	127(26.5)	32(53.3)	28 (46.7)

Table 6 shows that respondents perceived the existence of all ICT facilities and services that could support the adoption of BLA in the studied schools. It was revealed that respondents agreed that schools have learning environments that support the adoption of a BLA. The study further explored students' views as to whether the school environment supports the implementation of a blended learning approach. Students were asked to identify their agreement or disagreement with the school environment in supporting their learning via BLA. The results are presented in Table 7.

Table 7. Perceived Supportive School Environments for BLA Adoption

Perceived Supportive Learning Environments	Response	
	YES (F/%)	NO (F/%)
Do you think the school environment is supportive for you to learn via BLA	423 (88.1%)	12(11.9%)
At this school, do students have a way to access class resources and ask questions?	417 (86.9%)	63 (13.1%)
Do teachers at this school design lessons using a range of questions, materials, and links to other websites?	382 (79.6%)	98 (20.4%)
Do teachers make use of digital tools available that support student choice, voice and enhance student learning?	412 (87.5%)	68 (12.5%)
Do you feel that teachers at this school provide an environment for learning where you can succeed?	460 (95.8%)	20(4.2%)

Based on the results in Table 7, most respondents conceived that the school learning environments support the adoption of BLA. As such, item 1 to 5 exhibits that respondents remarked favourably on the available learning

environments in support of BLA adoption. Although some students showed disagreement, the number and percentages of students favour the premise that learning environments in studied secondary schools support the adoption of BLA.

BLA Usage in Secondary Schools

The study assessed the usage level of BLA in the studied secondary schools. Building from qualitative data, two indicators were established to determine the level of BLA usage: the rate of teachers trained to facilitate BLA usage, and the extent to which BLA is used by students and the possible challenges encountered in the application of BLA. The study presupposed that the level of adoption of BLA was indicated by the number of trained teachers, awareness of users about BLA, the level of BLA application, and the limited number of challenges in its application. Teachers were asked to provide their responses as to whether they were trained about the use of BLA. The descriptive results are provided in Table 8.

Table 8: Rate of Teachers Trained for Using BLA Adoption in studied Secondary Schools

Rate of teachers trained on BLA usage	**Teachers' response**	
	YES (F/%)	**NO (F/%)**
Did you attend any in-service training on BLA usage	44 (73.3)	16 (26.7)
Do you apply BLA in teaching your subject	39(65)	21 (35)
Did you attend training on the use of digital tools for teaching and learning in your school?	50(83.3)	10(16.7%)

Results in Table 8 indicate that 44 (73.3) teachers received training while 16(26.7) did not receive any training related to the application of BLA for teaching and learning. Furthermore, it was claimed that 39(65) teachers attested to apply a BLA in their subjects while 21(35) had nothing to do with the BLA approach in their subjects. Based on the findings, it can be reported that the level of BLA usage in the studied secondary schools was ranked high by both students and teachers. Figure 1 provides the results generated from both teachers and students' response.

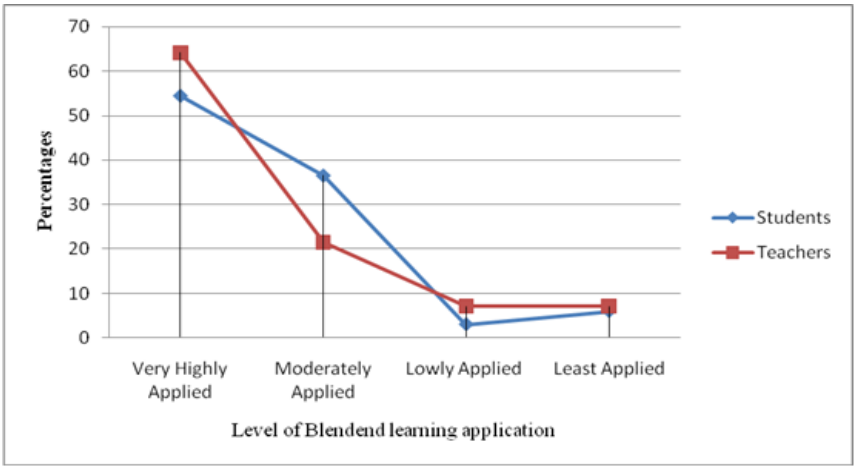

Figure 1. The extent of BLA Usage in studied Secondary Schools

It is verified from the figure 1 that BLA was very highly used in the studied secondary schools as perceived by 64% of teachers and 54% of students. However, 35% of students and 21% of teachers conceived that BLA was moderately applied in the schools. The study contends that the extent of BLA usage in the studied school was relatively high by 60% by accounting the mean of the two responses.

Discussion

Stakeholders' Perception on the Adoption of BLA

Stakeholders' perceptions were measured through two aspects including the understanding of the concept "BLA" and perception towards the practice of the BLA in the studied secondary schools. Data from the interviews show that the respondents had a basic understanding of the BLA. In specific, BLA was understood as the method of integrating several resources, learning materials, methods of learning, digital content and traditional methods for improving teaching and learning process. Interestingly, the results indicate that the adoption of BLA is imperative in enhancing teaching and learning in secondary schools. Though it is a preferred approach. The findings of the present study avowed prior results by Topping et al. (2022) who conceived that BLA is a useful approach to accessing teaching and learning materials. Moreover, our findings are also corroborated by Tan et al. (2022), who indicated that BLA was considerably better than online learning for possible enhancing task flexibility and opening door for collaborative learning. These findings perhaps report that almost all respondents are cognizant of BLA.

The discrepancies in awareness among respondents might be because some respondents are implementing BLA but are not fully aware of the program at their respective secondary schools. This is in support by Fernando (2020) who found that awareness of BLA is somehow shallow in some countries like Philippine since the learning style is not properly implemented. By awareness, it means that the knowledge gained through one's own perception or by means of information. According to a study by Hsu et al. (2018), teachers and school leaders and educational officers who were aware of the BLA had the potential to enhance children's long-term learning and memory. Similarly, a study conducted in India by Maruthavanan & Devi (2020)., concluded that there was no significant difference in the awareness of the blended learning approach among students and teachers in the Madurai district. As a result, the study proceeded with measuring the theoretical understanding of the concept of blended learning. In doing so, respondents were asked to indicate their understanding of BLA. Categorically, findings indicate that participants had a high theoretical understanding of the concept of BLA. This was an impressive observation since it provides ground to dig further into the nexus of theory and practice of BLA.

Learning Environments in Support of the Adoption of BLA

As it stands from the findings, several services and facilities were available in some studied secondary schools like wireless access points donated by mobile carriers like Tigo (cf., telecommunication company in Tanzania). The study further explored students' views as to whether the school environment supports the implementation

of BLA. Students were asked to identify their agreement or disagreement with the school environment in supporting their learning via BLA. It seems that school learning environments in studied secondary schools support students to learn via BLA. Some studies suggest that the primary focus for the adoption of BLA in secondary schools should be teaching and learning environments which support its adoption like pedagogical tools, ICTs facilities and devices (Antwi-Boampong & Bokolo, 2022; Maruthavanan & Devi, 2020). In context of learning environment, the study further inquired about the existence of some electronic devices and ICT facilities and services that were present in each studied secondary school have been engaging and using BLA. Students provided an inventory of ICT facilities that were present in the school. Our findings revealed that some studied secondary schools had the following facilities: well-furnished computer labs, the internet and electricity which allow both teachers and students to engage in enjoyable learning via BLA. Similarly, studies found that students who lack devices or the teachers themselves lack the equipment to teach via BLA (Hayati et al., 2021). Equally, a study conducted in Indonesia by Tamah et al. (2020) found that the availability and accessibility of ICT facilities and services have an impact towards the adoption of BLA among teachers and students.

In the case of this study, the existence of electronic and accessible ICT facilities and services could serve very little if schools lacked ICT experts, ICT teachers and the ICT help desk. The findings of the study helped to clarify that schools were perceived to support BLA since they possessed ICT facilities and infrastructures. The presence of these elements confirmed that the BLA could be carried out in secondary schools (Cheok et al., 2014). Following this situation, the study explored the presence of computer experts who could collaborate with teachers while implementing BLA. It appears that some secondary schools used to hire ICT experts from outside in case of need while some teachers acted as IT experts though were not fully employed for that purpose. This study contends that secondary schools demand further investments in ICT facilities, solutions and services in support of BLA (Apandi & Raman, 2020). The findings suggest that the implementation of BLA in secondary schools will necessitate a collaborative effort from multiple educational partners to enhance secondary schools' learning settings. Furthermore, the appropriate ministry should set aside funds for teachers' capacity building, the establishment of computer labs in schools, and the training of ICT teachers.

The Extent of BLA Usage in Secondary Schools

Researchers developed two indicators to determine the level of BLA usage: the rate of teachers trained to facilitate BLA usage, the extent to which BLA is used by students and the possible challenges encountered in the application of BLA. The study presupposed that the level of adoption of BLA was indicated by the number of trained teachers, awareness of users about BLA, the level of BLA application, and the limited number of challenges in its application. These results suggest that the application of the BLA in studied secondary schools is at a high level. The number of trained teachers was high equivalent to two-thirds of the respondents. As such, the importance of teacher training on the application of BLA was appropriate for the adoption of BLA because skilled teachers applied the knowledge, they had acquired to assist student learning. A study by Lalima and Dangwal (2017) supports this claim with the contention that among other preconditions for the use of a BLA

is to have well-trained teachers. Perhaps this might have been caused by challenges related to the lack of stable internet connectivity and ICT devices among teachers and students.

Based on the findings, it can be reported that the extent of usage of BLA in studied secondary schools was relatively high by both students and teachers. The findings provide a more nuanced understanding of conditions relevant to the adoption of BLA in secondary schools in developing countries like Tanzania as well as stakeholders' perceptions of BLA. The study concurs with that of Hayati et al. (2021) and Villanueva et al. (2023) conducted among secondary school teachers in Malaysia and Indonesia. The study establishes that teachers, especially senior teachers, who are not trained with proper training and knowledge will have a hard time adapting to learning technology. Furthermore, the findings suggest that achieving BLA requirements for implementation in secondary schools will improve teaching and learning and, as a result, students' learning outcomes. That is, in the end, instructors can incorporate a blended learning approach into their teaching methods, and governing bodies can dedicate more resources to encourage BLA adoption in schools.

Conclusion

The findings of the study offer the following crucial conclusions: first, stakeholders perceived BLA as an essential and useful methodology for teaching and learning Tanzanian secondary schools. And that, if appropriately used, BLA increases the quality of education offered in secondary schools. Second, many facilities and services were uncovered to be present in secondary schools under study, and these features appear to be some of the deciding criteria for supporting BLA adoption and implementation in secondary schools. That is, computer laboratories, electricity, a few skilled professionals, ICT infrastructures, and ICT teachers are considered as necessary characteristics for BLA acceptance in secondary schools. Further, school learning environments with such services, facilities and infrastructures are perceived to be potentially promoting and supporting the BLA adoption in secondary schools. Third, it is sufficient to conclude that the level of BLA usage in studied secondary schools was in varying levels. In other words, a good number of teachers were provided with training on the use of BLA in their respective schools, in retrospective, good understanding of BLA, teacher training and supportive school learning environments increases the level of BLA usage.

Recommendations

The results of this study have several implications. The research findings revealed that stakeholders are interested in the use of blended learning approach in schools. This calls for the government policy action to extend and stabilize the approach to be implemented in other schools across the country. It is, further, recommended that the decision-makers in education should consider the need to improve the practice of in-service training for teachers and other education officers on the use of BLA and related learning technologies. Finally, the following recommendations are made: Since some teachers who were reported to have not attended any training on the use of BLA, there is an urgent need for the government, non-governmental organisations, and other stakeholders to set aside resources and provide training on the use of BLA. On the basis of the

findings, further study should focus on assessing the role of BLA in improving students' academic performance. Another new area for further research could be related to the assessment of the relationship between teachers' level of BLA mastery and the use of BLA knowledge in teaching lessons.

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Authors Information

Haruni Machumu
https://orcid.org/0000-0002-5743-8906
Mzumbe University
P. O. Box 5 Mzumbe-Morogoro
Tanzania

Tusekilege Mwamkinga
https://orcid.org/0009-0003-5925-5227
Mzumbe University
P. O. Box 5 Mzumbe-Morogoro
Tanzania

Abdallah Jacob Seni
https://orcid.org/0000-0003-0904-5267
University of Dodoma
P.O.BOX 259, Dodoma
Tanzania

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Clarifying the Mediation Role of Social Media Addiction in the Association between COVID-19 Risk Perception and Mental Well-Being among General Population in Türkiye

Neslihan Çıkrıkçı
Tokat Gaziosmanpaşa University, Türkiye

Özkan Çıkrıkçı
Tokat Gaziosmanpaşa University, Türkiye

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Abstract

In current paper, the associations among COVID-19 risk perception, social media addiction, and mental well-being was examined. Additionally, the mediation role of social media addiction in the association between COVID-19 risk perception and mental well-being was explored. Through snowball and criterion sampling method, data were collected from 59 males (19%), 248 females (80%) and 3 (1%) individuals who did not want to specify their gender. The ages of the individuals included in the sample ranged from 18 to 75 (M = 26.28, SD = 9.40). According to the correlation analysis findings, there were significant associations among COVID-19 risk perception, social media addiction and mental well-being. Mediation analysis revealed that social media addiction had a mediation role in the association between COVID-19 risk perception and mental well-being. Research findings revealed the potential impact of COVID-19 risk perception and social media addiction on mental well-being.

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Corresponding Author: Özkan Çıkrıkçı, ozkanc61@hotmail.com

Introduction

In addition to the treatment of emerging psychopathologies, the process should be handled with great care in order to prevent psychopathologies that have not yet occurred. The world is currently dealing with a pandemic medically and will fight against the psychopathologies that arise or may arise with the help of pharmacological and psychotherapy. There is a point to be emphasized here, and positive psychology was born precisely from this point of view. What about the undiagnosed individual? In addition to the traditional psychopathology-oriented perspective, positive psychology focuses on enhancing well-being by focusing on the competencies, potential and latent powers of the individual (Seligman & Csikszentmihalyi, 2000). The theoretical structure about well-being is quite evident. Various components of well-being have been mentioned in the related literature. While the hedonist perspective was more concerned with subjective well-being, the oedonomic perspective was more related with psychological functionality and was called psychological well-being (Diener, 2006). The dependent variable of this study was psychological well-being. Psychological well-being focuses on activating the potential of the individual to realize himself/herself and find the meaning of life against to difficulties (Ryff & Singer, 2008). From this perspective, psychological well-being might be considered as an extremely important concept in the pandemic days. Unfortunately, many people around the world do not leave their homes due to precautions such as social isolation, quarantine and curfews. In addition to precautions, people who do not want the virus to infect them stay at home. Various changes have occurred in behavior among individuals during staying at home.

The effects of excessive use of the Internet on individuals were well known. While there were positive and significant associations between excessive internet use and psychopathological symptoms (Guo et al., 2019; Kumar et al., 2019; Vally et al., 2020), it was negatively associated with positive psychology dimensions such as positivity, life satisfaction, subjective well-being, psychological well-being (Çıkrıkçı, 2019; Gheitaran et al., 2019; Odacı & Çıkrıkçı, 2014; Turan et al., 2020). Similarly, there were negative associations between social media use and life satisfaction (Hawi & Samaha, 2017), subjective well-being (Gerson et al., 2016) and psychological well-being (Lee et al., 2014). The results of these studies could refer that social media addiction has a disruptive effect on these positive structures. It was stated that the basis of this negative interaction may be related to negative reinforcement processes in control mechanisms (Brand et al., 2014). Individuals who cannot be sufficiently active in the reinforcement processes may overuse the internet or social media. The assumptions of the cognitive behavioral model may be valid for the etiology of the deficiencies in the control processes. According to this model, dysfunctional behaviors and maldaptive cognitions accompanying these behaviors may lead individuals to use internet excessively (Caplan, 2002, 2010).

The theoretical basis of this research was the cognitive behavioral model. In present study, the COVID-19 risk perception was determined as an independent variable. During the pandemic period, interest in studies on risk perception (Hodžiü et al., 2020) and risk taking (Egeli et al., 2021) has increased. COVID-19 risk perception can lead individuals to use social media for different purposes. Obtaining information about the pandemic, avoiding the intense emotions created by the pandemic and awareness, and spending time in the social isolation process can be among these purposes. The recent studies stating that social media was used more and for different purposes during COVID-19 pandemic (Boursier et al., 2020; Primo, 2020). For instance, even social media posts were changed during the pandemic. People tend to share familiar thoughts and feelings. Overall, it could be concluded that the survival seems to have brought people together throughout social media (Kaya, 2020). Therefore, the processes that lead individuals to use social media, such as the reasons for using social media during the social isolation or quarantine process, may also differ. It was assumed that COVID-19 risk perception may also have an impact on individuals' use of social media. These evaluations were thought to have an explanatory role not only on social media use but also on psychological well-being. Because, the individuals, who are aware of the risk of the COVID-19 virus, may reduce their positive perceptions or not fully exhibit potential due to limiting life. Lack of being able to act autonomously and independently in this process may make it difficult for the individual to act in line with the meaning of life. It can be stated that the negative cognitions, affective and behavioral structures may be the factors that prevent the development of psychological well-being. Social media addiction was determined as the mediator variable in present study. The mediator variable absorbs the explanatory role of the independent variable on the dependent variable due to its structure. In other words, since the mediator variable is included in the model, the explanatory role of the independent variable on the dependent variable decreases or disappears (Baron & Kenny, 1986). In current paper, a theoretical model was proposed that COVID-19 risk perception may lead to a positive increase in social media addiction and that social media addiction may lead to a decrease in mental well-being. The determination of the effects of COVID-19 risk perception on mental well-being throughout social media addiction represents the originality and novelty of the current research. The aim of this study was to examine the mediating role of social media addiction in the association between COVID-19 risk perception and mental well-being.

Method

Sample

Snowball and criterion sampling method was determined. Measures were planned as online questionnaire. The online questionnaire was shared through google forms. In addition to that, the link was shared with people accessible by the researcher via e-mail, Instagram, and WhatsApp. Shared people were asked to share the link of the online questionnaire with other participants who are over 18 years of age. Living in Turkey (i), to be 18 years of age and over (ii) and to comply with the rules of social isolation (iii) were the criteria for being included

in the sample. Among these criteria, it is appropriate to explain the rules of social isolation process. Full-time quarantine was not applied for whole society in Turkey. Government officials and experts were instructing the whole community to stay in your home and follow social isolation. The social isolation process indicates that individuals stay at home voluntarily and thus the physical distance / contact between other people is reduced. Therefore, we call this process as social isolation.

The sample was composed of 310 participants. Additionally, the sample consisted of 59 males (19%), 248 females (80%) and 3 (1%) individuals who do not want to specify their gender. The ages of the sample ranged from 18 to 75 (Mage = 26.28, SD = 9.40). While there were 28 (9%) chronic patients in the sample, there were 35 (11.3%) participants received a psychiatric diagnosis before. The majority of the sample (n = 193, 62.3%) mostly followed the news about the COVID-19 pandemic on the internet. Furthermore, it was determined that 37.3% of the sample followed the news about the COVID-19 pandemic on television. The average of daily internet usage times was 5.28 hours (SD = 2.73).

Ethical Consideration and Procedure

A number of ethical procedures were applied in all processes of the study (American Educational Research Association, 2011; American Psychological Association, 2020). Ethical processes recommended by the American Psychological Association (APA, 2020) were operated. Participation in the study was completely voluntary. Each individual participating in the study declared that he/she has read and understood the notification form regarding the purpose of the research and how the it was conducted and approved voluntary participation. No descriptive information was requested regarding the participants. Much attention was paid to the privacy, reputation and rights of the participants. Participants were assured that they can leave the study at any stage of the study if they wish. I had the analysis and reporting processes carried out in line with the principle of transparency and prepared a qualified and responsible publication in line with the publication ethics. The research data were collected through online questionnaire. The researcher prepared online forms and the link related to these forms were shared with the sample. It took approximately 20 minutes for a participant to evaluate online questionnaires. The data collection process took 7 days in total.

Measures

The Risk Perception of COVID-19 Scale (RPCV-19S)

RPCV-19S was developed within the scope of this study in order to determine the level of evaluation of the dangerousness of the COVID-19 virus by individuals. While writing the items, the H1N1 Perception Scale, which aims to determine the perceptions about swine flu, was used by Çırakoğlu (2011). The RPCV-19S consisted of 7 items. It was a self-report based five-point Likert-type (1 = strongly disagree… .5 = strongly agree). The high scores obtained from the RPCV-19S with no reverse items indicates the high level of COVID-19 risk perception. Single factor structure explained 48.94% of the total variance. As a result, RPCV-19S consisted of seven items and it was concluded that item factor loads range between $\lambda = .54$ and $\lambda = .79$. Within the scope of the construct validity of the RPCV-19S, confirmatory factor analysis was applied. According to

the confirmatory factor analysis results, the single-factor model indicated excellent fit to the data: χ^2 = 23.49, *df* = 12, *χ2 / df* = 1.96; *GFI* = .978, *CFI* = .986, *AGFI* = .950, *TLI* = .971, *SRMR* = .034, *RMSEA* = .056 90% Bca [.020, .089]. The standardized factor loads of the items varied between λ = .45 and λ = .75. After completing the validity analysis of RPCV-19S, the reliability analysis was performed. The reliability of RPCV-19S was determined by Cronbach Alpha internal consistency coefficient and the McDonald Omega coefficient. Accordingly, the Cronbach Alpha value of the RPCV-19S was calculated as α = .82 and the McDonald Omega coefficient as ω = .83 (Appendix).

Bergen Social Media Addiction Scale (BSMAS)

BSMAS was developed to measure social media addiction (Andreassen et al., 2016). It consisted of six items that reflect the essence of addictive elements (Griffiths, 2005). It was a self-report five-point Likert-type measure (1 = very rarely… 5 = very often). The high scores obtained from the BSMAS indicate a high level of social media addiction. Example item: “How often during the last year have you tried to cut down on the use of social media without success?”. Demirci (2019) adapted BSMAS into Turkish. The construct validity of the Turkish form was tested by confirmatory factor analysis. According to the CFA results, the single factor model showed acceptable fit to the data (CFI = 0.99, TLI = 0.99, SRMR = 0.031; RMSEA = 0.039). The internal consistency coefficient of the BSMAS Turkish version was determined as .82 and .83 in two different samples (Demirci 2019). In current study, the validity and reliability of the BSMAS were re-tested (N = 310). As a result of the CFA performed for the purpose of construct validity, it was determined that the single factor model indicated excellent fit to the data (CFI = 0.99, TLI = 0.98, SRMR = 0.023; RMSEA = 0.052). Reliability analysis was carried out with the internal consistency coefficient and the Cronbach Alpha coefficient was calculated as α = .84.

Warwick-Edinburgh mental well-being scale (WEMWBS)

WEMWBS was developed to determine the mental well-being (Tennant et al., 2007). WEMWBS consisted of 14 items. The items of the WEMWBS included psychological and subjective well-being. It was a self-report-based five-point Likert-type measure (1 = strongly disagree… 5 = totally agree). Example item: "I’ve been feeling good about myself". Keldal (2015) adapted WEMWBS into Turkish. The construct validity of the Turkish form was tested by confirmatory factor analysis. According to the CFA results, the single factor model showed good fit to the data (CFI = 0.96, NNFI = 0.95, RMR = 0.54). The internal consistency coefficient of WEMWBS Turkish version was determined as .92 (Keldal, 2015). In current study, the validity and reliability of the WEMWBS were re-tested (N = 310). As a result of the CFA performed for the purpose of construct validity, it was determined that the single factor model showed acceptable fit to the data (CFI = 0.91, TLI = 0.89, SRMR = 0.052; RMSEA = 0.09). Reliability analysis was performed using the internal consistency coefficient and the Cronbach Alpha coefficient was calculated as α = .93.

Analytical Approach

In this research, firstly, the psychometric properties of RPCV-19S were investigated. After the RPCV-19S was determined to be valid and reliable, the procedures for mediation analysis were carried out. For this purpose, the associations between variables were examined using the Pearson Product of Moments Correlation Coefficient technique. SPSS Process Macro (Model 4) application was used for mediation analysis (Hayes, 2018). Model 4 allows the determination of how the effect of the independent variable on the dependent variable varies based on the mediator variable. SPSS 24.0 and Amos 24.0 software were used for the analysis of the study.

Results

Preliminary Analysis

As seen in Table 1, COVID-19 risk perception associated with social media addiction (r = .30, p < .01; 95%CI [.18, .41]) and mental well-being (r = -.14, p < .05; 95%CI [-.25, -.03]). Additionally, a significant relationship was found between social media addiction and mental well-being (r = -.26, p <.01; 95%CI [-. 38, -.14]). Results of correlational analysis were presented in Table 1.

Table 1. Zero-order correlations among study variables

	M	SD	1	2	3
MWB (1)	53.89	10.20	1		
SMA (2)	15.03	5.61	-.26**	1	
RPCV (3)	15.44	4.40	-.14*	.30**	1

Note. N = 310. **p < .01, * p < .05. Bootstrapping process was confirmed with 10.000 bootstrap samples. MWB = Mental Well Being, SMA = Social Media Addiction, RPCV = Risk Perceptions of COVID-19

Mediation Analysis

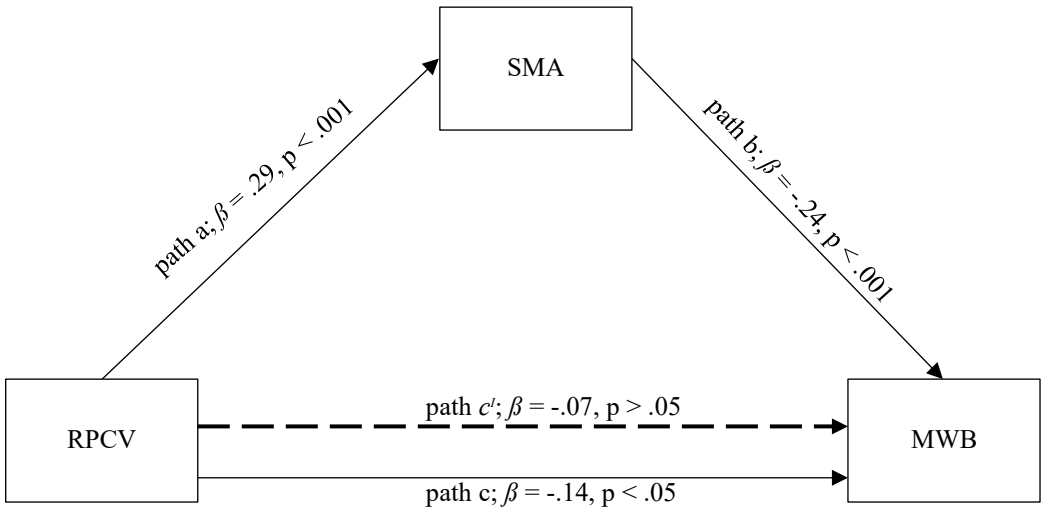
PROCESS macro (Model 4) was used to determine the mediation role of social media addiction in the association between COVID-19 risk perception and mental well-being. When the standardized regression coefficients were examined, the total effect of COVID-19 risk perception on mental well-being was found to be significant (β = -. 14, SE = .13, $t_{(309)}$ = -2.49, p <.05, 95%CI [-.58 , -.07], path c, Step 1). Additionally, COVID-19 risk perception was found a significant predictor of social media addiction (β = .29, SE = .07, $t_{(309)}$ = 5.47, p < .001, 95%CI [.24, .51], path a, Step 2). After determining the explanatory role of the independent variable on the dependent variable and the mediator variable, the explanatory role of the mediator variable on the dependent variable was examined. Accordingly, social media addiction was a significant predictor of mental well-being (β = -.24, SE = .10, $t_{(308)}$ = -4.10, p < .001, 95%CI [-.64, -.22], path b, Step 3). At the last stage of the mediation analysis, the mediator variable was included in the model and the explanatory role of the independent variable on the dependent variable was re-evaluated. When social media addiction was included in the model, it was determined that there was no significant relationship between COVID-19 risk perception and mental well-being (β = -.07, SE = .13, $t_{(308)}$ = -1.22, p > .05, 95%CI [- 42, .10], path c^{I}, Step

4). Therefore, the association between COVID-19 risk perception and mental well-being had fully mediated by social media addiction (Table 2). In other words, there was a significant indirect effect of COVID-19 risk perception on metal well-being through social media addiction (*ab* = -.16, 95%CI [-.28, -.06]) (Fig 1).

Table 2. Direct and indirect effects

Model pathways	Effect	95% BCa		S.E	C.R.
		Lower	Upper		
Direct effect					
RPCV →SMA	.29	.24	.51	.07	5.47**
SMA→MWB	-.24	-.64	-.22	.10	-4.10**
RPCV →MWB	-.14	-.58	-.07	.13	-2.49*
Indirect effect					
RPCV →SMA→MWB	-.16	-.28	-.06	---	---

Note. N = 310. **p < .01, * p < .05. Bootstrapping process was confirmed with 10.000 bootstrap samples. MWB = Mental Well Being, SMA = Social Media Addiction, RPCV = Risk Perceptions of COVID-19



Note. MWB = Mental Well Being, SMA = Social Media Addiction, RPCV = Risk Perceptions of COVID-19

Figure 1. Mediation of social media addiction in the association between risk perceptions of COVID-19 and mental well-being with standardized beta values.

Discussion

In present study, the mediation role of social media addiction in the association between the COVID-19 risk perception and mental well-being was examined. Correlational analysis revealed that there were significant association between the COVID-19 risk perception and mental well-being. The results showed that the COVID-19 risk perception is a significant predictor of mental well-being. This finding suggested that an

increase in the COVID-19 risk perception may lead to a decrease in mental well-being. In other words, individuals who can evaluate the COVID-19 outbreak from different aspects may decrease their mental well-being. Various factors may have been effective in the formation of this finding. First of all, individuals who can evaluate the risk rationally can consider the social isolation and quarantine process as an obstacle to self-realization. Ryff (2013) emphasized the importance of self-actualization in the development of well-being. From the existential point of view, self-actualization tendency is regarded as the representative of a function related to the existence of the psychological health among individuals who lives an active life (Shutenko, 2014).

An individual who is deprived of active life due to the COVID-19 pandemic may not exhibit the potential of self-realization during time at home, and this may cause a decrease in mental well-being. Miquelon and Vallerand (2006) reported that there was a positive significant association between self-actualization and happiness. Social isolation or quarantine can be very restrictive for the individuals who have a more hedonistic perspective in their active life. Because as hedonists shorten the distance between what they desire and what they have, they gain satisfaction from life and increase their well-being (Çıkrıkçı, 2016). Social isolation and quarantine practices can prevent people from having the gains they desire. In this negative relationship, irrational beliefs and functional attitudes developed by individuals with high level of COVID-19 risk perception may also be effective. Individuals' perceptions were accepted as an expression of their emotions and behaviors (Beck, 1995). Subjective experiences of the individual were extremely important in the formation of perceptions (Beck, 1993). Therefore, the social isolation and quarantine process, or the world's struggle with COVID-19, has been a subjective experience for the individual. This subjective experience may cause differences in an individual's perceptions, belief system and attitudes (Beck, 1964).

The COVID-19 pandemic has been an extremely subjective situation for all humanity and continues to affect the lives of individuals in various dimensions. Mental well-being would be thought to be one of these dimensions. Findings from previous studies revealed that irrational beliefs and dysfunctional attitudes were associated with diverse aspects of well-being (Day & Maltby, 2003; Judge & Locke, 1993; Stein & Grant, 2004). Another dimension that may be related to these cognitive structures of individuals may be functional in explaining the determined negative relationship. Risk perception can be detrimental to the well-being of individuals in social isolation or quarantine. Individuals who can perceive the risk correctly may think that this pandemic may continue for a certain period of time and will force them to spend their time at home. Perhaps not perceiving the risk in this way, but the inferences that it makes towards the future with the help of risk perception may decrease the well-being. The individuals staying at home have to spend time with their partners, children or other family members. During this time, conflicts with these individuals may increase, maybe physical and emotional violence may be observed, or people who share the same house may move away from each other. Reports on violence have been coming from different parts of the world (The Conversation, 2020; The Guardian, 2020). For example, in social isolation process in Turkey, between March 15-31 in 2020, eighteen women were killed by their husbands at home and an increase in cases of violence against women has been increasing (Hürriyet, 2020). The hedonistic and oedomic structures of individuals who might perceive the risk and make an assessment in this and similar direction may damage. However, these inferences need to be proven scientifically and it is recommended that future studies should focus on these dimensions as well.

According to the results of mediation analysis, social media addiction has a full mediation role between COVID-19 risk perception and mental well-being. In other words, COVID-19 risk perception has a negative indirect effect on mental well-being through social media addiction. This finding indicated that the COVID-19 risk perception has an explanatory role on mental well-being throughout the mediator variable (social media addiction). This finding can help understand how and why social media addiction contributes to the explanatory role of COVID-19 risk perception on mental well-being. Accordingly, it can be stated that the increase in the COVID-19 risk perception may cause an increase in social media addiction and the increase in the mediator variable based on the COVID-19 risk perception may also reduce mental well-being. It was known that there were significant associations between well-being and behavioral addictions such as social media addiction.

The increase in time spent on social media and the quality and quantity of social media behaviors can negatively affect individuals' cognitive and affective evaluations (Griffiths, 2005). It is possible that social media addiction, which can cause highly destructive behavioral experiences, may have a decreasing effect on individuals' well-being. Social media addiction can be an obstacle to individuals' reaching their goals and meeting their needs. In line with the Erek (Telic) theory, it can be stated that these obstacles can distract the individual from well-being. Individuals who cannot meet their needs or meet their needs at the desired level cannot achieve the well-being they desire (Wilson, 1967). Social media addiction is a concept in which various negative behavior parameters are evaluated. One of these parameters is avoiding negative emotions experienced by the individual (Griffths, 2005). Instead of dealing with their negative emotions, the individual may prefer to avoid them and turn to social media.

Perceptions of COVID-19 risk may cause the individual to develop different negative emotions (ex: anger, fear, doubt etc.). The individual may turn to social media in order to escape from these emotions, which can become increasingly intense in line with social isolation, quarantine and news about pandemic. As stated before, the change in an individual's risk perception and development of irrational beliefs can also lead individuals to use social media. As a result, being aware of the risks of COVID-19 increases an individual's chances of survival by avoiding the disease. However, it is thought that this awareness should also be managed rationally. Otherwise, it seems likely that different psychopathologies may occur as well as behavioral addictions.

Conclusions

The findings of the present study provided new associations in accounting for mental well-being in terms of COVID-19 risk perception and social media addiction. At the same time, a measure was developed that allows to examine the perceptions of COVID-19. The present research was the first scientific study to examine the association among COVID-19 risk perception, mental well-being, and social media addiction. This study provided empirical findings that social media addiction has a full mediation role in the association between COVID-19 risk perception and mental well-being.

Limitations and Recommendations

This cross-sectional study has some limitations. First, the sample of the research could be emphasized. Snowball sampling and criterion sampling methods were used in the research. These methods made random sample selection difficult and generalization of the data obtained from the sample to the population became difficult. The second limitation is that cross-sectional data were used in regression-based mediation analysis. Therefore, a cause and effect interaction between variables could not be identified. The third limitation was again related to the design of the research. Time-based interactions of variables could not be evaluated due to the design of the research. In order to determine the cause and effect interaction, time-based changes and causal relationships between variables, it is suggested that future studies should be carried out in an experimental and longitudinal design. Response bias was one of the limitations considered in the study. Although the participants declared voluntarily participation, they may not have responded sincerely to the statements in the measures. Another limitation was social desirability. The participants may have presented themselves as someone different from what they actually are.

In present study, COVID-19 risk perception and social media addiction were determined as predictors of mental well-being. In addition, social media addiction had emerged as a mediator. Future studies should be focused on the impact of COVID-19 risk perception on social media addiction in what ways and how. However, the reasons for the decrease in mental well-being of individuals with high level of COVID-19 risk perception should be investigated. In other words, it should be investigated how to increase the well-being among individuals who did not have a psychopathological diagnosis but witnessed the COVID-19 pandemic. Mamun and Griffths (2020) emphasized the importance of nationwide epidemiological studies on mental health issues related to the COVID-19 pandemic. It may be emphasized that this method can be effective in developing mental well-being strategies. In addition to these recommendations, it could be important to determine the well-being of individuals diagnosed with COVID-19 and their families and healthcare professionals (Xiang et al., 2020).

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Appendix

The Psychometric Properties of the Risk Perception of COVID-19 Scale (RPCV-19S)

While the validity of The Risk Perception of COVID-19 Scale (RPCV-19S) was investigated, item analysis firstly was performed. It was determined that the item-total correlation values of the items in the item pool ranged from .42 to .66. After item analysis, exploratory factor analysis was applied to determine RPCV-19S factor structure. There are some requirements for the exploratory factor analysis that the data set must meet. These requirements are that the sample size must be sufficient and the data must be suitable for factor analysis. For this purpose, Kaiser-Meyer-Olkin (KMO) and Barlett Sphericity tests should be performed. It was concluded that the Barlett Sphericity test for the measure, in which the KMO value was determined as .84, was significant ($x^2_{(21)} = 707.91$, $p < .001$). In line with the results, it could be stated that the sample size and the obtained data were suitable for factor analysis. In the exploratory factor analysis process, the value of .50 was accepted as the cut-off point for factor loads. In the exploratory factor analysis based on the principal components analysis, it was determined that the items were collected under a single factor. Single factor structure explained 48.94% of the total variance. As a result, RPCV-19S consisted of seven items and it was concluded that item factor loads range between $\lambda = .54$ and $\lambda = .79$. Finally, within the scope of the construct validity of the RPCV-19S, confirmatory factor analysis was applied. According to the confirmatory factor analysis results, the single-factor model indicated excellent fit to the data: $x^2 = 23.49$, $df = 12$, $x^2 / df = 1.96$; $GFI = .978$, $CFI = .986$, $AGFI = .950$, $TLI = .971$, $SRMR = .034$, $RMSEA = .056$ 90% Bca [.020, .089]. The standardized factor loads of the items varied between $\lambda = .45$ and $\lambda = .75$. After completing the validity analysis of RPCV-19S, the reliability analysis was performed. The reliability of RPCV-19S was determined by Cronbach Alpha internal consistency coefficient and the McDonald Omega coefficient. Accordingly, the Cronbach Alpha value of the RPCV-19S was calculated as $\alpha = .82$ and the McDonald Omega coefficient as $\omega = .83$.

Table 1. Descriptive statistics and item-total correlation of The Risk Perception of COVID-19 Scale (RPCV-19S)

Item number	Mean (SD)	Corrected-item total correlation	Item exclusion or retention
1	2.66 (.81)	.62	Retained
2	2.21 (1.01)	.42	Retained
3	2.67 (.91)	.65	Retained
4	1.89 (.88)	.51	Retained
5	1.34 (.70)	.64	Retained
6	2.11 (1.00)	.66	Retained
7	2.56 (.99)	.44	Retained

Table 2. Factor loadings of The Risk Perception of COVID-19 Scale (RPCV-19S)

Item number	Factor loadings
3	.79
7	.78
6	.77
1	.76
4	.64
5	.56
2	.54
Total Variance	48.94%

Table 3. Standardized factor loadings, t values, R2 values and error variances

Item	λ	t value	R^2	Error variance
1	.66	------*	.44	.37
2	.45	6.79	.20	.82
3	.70	13.51	.49	.42
4	.56	8.32	.32	.52
5	.46	6.89	.21	.38
6	.75	10.26	.56	.44
7	.74	10.24	.55	.44

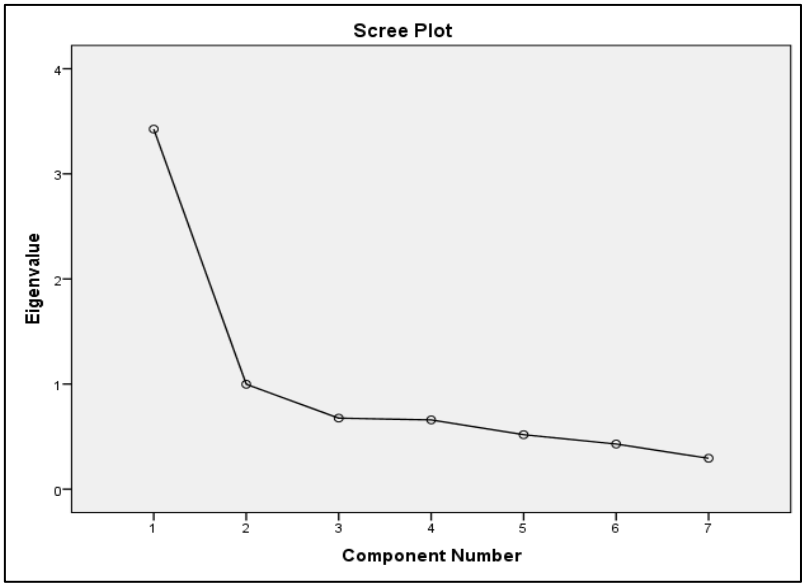
Note.* This value was equal to 1 for estimation purposes.. λ = factor loadings

Table 4. Risk Perception of COVID-19 Scale (RPCV-19S)

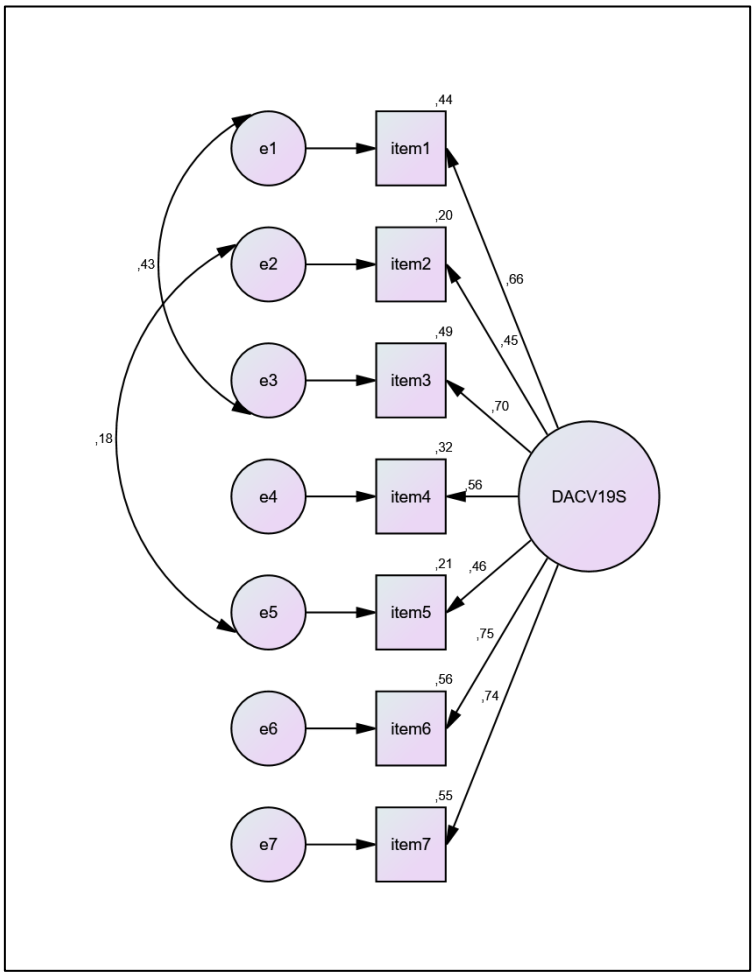
Items	Statement
1	COVID-19'un ifade edildiği gibi tehlikeli bir hastalık olduğunu düşünüyorum. *I think COVID-19 is a dangerous disease as stated.*
2	COVID-19'un tedavisi olan bir hastalık olduğunu düşünüyorum. *I think COVID-19 is a curable disease.*
3	Uzmanların COVID-19 hastalığını abarttığını düşünmüyorum. *I don't think experts are exaggerating the COVID-19 disease.*
4	COVID-19 hastalığının ölümle sonuçlanabileceğini düşünüyorum. *I think COVID-19 disease can result in death.*
5	COVID-19'un bulaşıcı bir hastalık olduğunun farkındayım. *I am aware that COVID-19 is an infectious disease.*
6	COVID-19'un kolay bulaşabilen bir hastalık olduğunu düşünüyorum. *I think COVID-19 is an easily contagious disease.*
7	COVID-19'un kadın-erkek, genç-yaşlı ayırmadan bulaşabileceğinin farkındayım. *I am aware that COVID-19 can be infected without separation between men and women, young and old.*

Note. Statements written in italics are the English translation of scale items. The present study was conducted with Turkish people. Therefore, the validity and reliability exploration of English version of the RPCV-19S was not performed. Items in English were provided for informational purposes only.
RPCV-19S is a five point Likert-type (strongly disagree = 1, disagree = 2, neither agree nor disagree = 3, agree = 4 and strongly agree = 5) self-report measure.

Scree Plot Graph



Path Diagram



Authors Information

Neslihan Çıkrıkçı
https://orcid.org/0000-0002-6091-9356
Tokat Gaziosmanpaşa University
Faculty of Education, Taşlıçiftlik Campus, 60250 Tokat / Türkiye

Özkan Çıkrıkçı
https://orcid.org/0000-0002-9789-5888
Tokat Gaziosmanpaşa University
Faculty of Education, Taşlıçiftlik Campus, 60250 Tokat / Türkiye