

Original Article**Meta-synthesis of the Principals Role of Psychological and Center Skills in Implementing Blended Learning from Quantum Paradigm Perspectives**Bitah Abdolhoseini *¹, Mohammad Reza Sarmadi ²

1. Ph.D. in Educational Administration, Lecturer of Farhangian University, Tehran, Iran

2. Professor, Department of Educational Sciences, Payame Noor University, Tehran, Iran

Received: 2022/06/22**Accepted:** 2022/10/22**Abstract**

In regards to the need to use technology in the domain of learning and the important role of principals of educational organizations in implementing the blended learning, this research was carried out with the aim of identifying the parameters of psychological and center skills of principals in implementing the blended learning from quantum paradigm perspectives. The research method was qualitative and of meta-synthesis. Data collection was carried out through reviewing scientific documents and resources relevant to the subject of research in recent 31 years (1990-2021). Therefore; the related key words were searched in the reliable internal and foreign websites and finally, 43 resources were selected for final review. The review was done through studying the resources of the principals' psychological skills in three dimensions and eleven parameters and center skill in one dimension and three parameters. The results obtained from this research showed that with regards to the identified dimensions and parameters, principals can play roles in implementing the blended learning in educational organizations, from the psychological skills, in quantum seeing dimension, by planning informed and effective leadership and confronting challenges and eliminating obstacles, in quantum thinking dimension via creative thinking, change and comprehensive thinking, in quantum feeling via accountability, supporting individuals' rights and security, respecting values, caring about needs and talents and utilizing the process of information and from center skills perspectives and quantum being dimension, via establishing an appropriate learning atmosphere, establishing effective communication and creating a resilient and network-centric structure.

Keywords

psychological skills, center skill, blended learning, principals, quantum paradigm, meta-synthesis.

Introduction

One of the most important challenges of the 21st century educational system is how to educate learners in order for them to be able to have readiness to face the changing society and the complexities of information explosion era (Mousavi, 2018), therefore; to coordinate with these changes, learners should learn to be lifelong learners (Bourdon, 2014). Lifelong learning will provide individuals with equal opportunities through eliminating the limitations related to time and place in a manner that people can no longer be satisfied with one particular type of education and instead the requirement of a society to learners where learners are themselves responsible for their own learning should be alleviated through using modern and resilient methods. Hence a new approach is felt by which learners can manage a huge amount of information and be lifelong learners. One of these approaches is the blended learning (Moradi Mokhles, Mehdizadeh & Emadi, 2011). The blended learning has been accepted as a method to present educational contents during recent years. Many educational centers are in search of holding

blended courses for those who prefer to replace the traditional and face-to-face meeting in classrooms with online education (Mossavar-Rahmani & Larson- Daugherty, 2007). The blended education approach provides the most efficient and effective educational method in the process of learning throughout the fast and competitive world (Kumar, 2012).

The blended learning has enabled customization of learning and has caused an individual's progress, it enhances interactivity and incentives of learners, enables online tests and increases the learning time and the resources used in this regard, improves working conditions, reduces educational system costs, the learning programs are better accepted by learners and the digital gap is minimized, as well (Bailey, Ellis, Schneider, & Vander Ark, 2013). No educational system can ignore such advantages. This issue will persuade principals to utilize the blended learning. Studies show that leadership is one of the most significant and effective factors in utilizing technology in classrooms (Murphy, 2017). As a matter of fact, any attempt to change and prepare learners for the information era requires principals' effective technology leadership. The technological leadership of principals will enhance learners' technological literacy and persuade them to use technology in their education. Moreover, the technological leadership can affect the efficacy of education via educators' technological literacy. Therefore; principals, as the technology leaders, should codify and implement a vision appropriate with technology (Chang, 2011). Principals should set the stage for utilizing technology in educational atmosphere and be aware of how to use this technology in order to change learning structure, enablement of teachers and assist learners (Gosmire & Grady, 2007).

The technological advances during the past 30 years have invasively destroyed and outdated all the structured and social relationships through web, internet and social media. The digital world has changed organizational structures and leadership styles. It is obviously understandable that the Newton's approach can no longer counter the modern problems, therefore; the social sciences scientists have adapted the quantum mechanics and physics with social problems. (Kocak, 2020). In an educational system, technology can be converted to a catalyst for learning and teaching (Hawkins, 2005) and quantum paradigm, together with modern mental arrangement, can help principals to put to use instability and crisis in a positive manner in order to create new concepts and stimulate doubt and continuous questions and unending learning (Stacey, 2003). While any change in facilities and learning conditions, variety in learning methods, self-management in learning and coordinating the learning process and its speed with learners' status which are features of blended learning will be made possible in quantum paradigm test bed (Murphy, 2017).

Quantum leadership pays attention to creativity, innovation, trust and change and intends to do appropriate jobs. The presence and implementation of quantum leadership parameters has enabled staff to improve capabilities levels and equipped them to provide the organizational requirements with modern knowledge related to their professions.

The aim of quantum leadership is to maximize efficacy and capabilities of an organization's principals and staff. Establishing self-governing groups, presenting extensive feedback to principals and staff which prevent costly mistakes for an organization, are all strategies used in quantum leadership (Darling & Walker, 2001). Therefore; staff preparedness for organizational change necessitates quantum skills in principals (Shelton, 2010).

In principals' psychological skills, quantum seeing has set the stage for change and transformation. Quantum thinking guides the principals' mental skills towards creativity and initiatives which result from contradictory and conflicting thinking and acting in a conflicting manner and in addition to this issue, quantum feeling means a sense of being alive and rehabilitating.

Principals, possessing such skills, will internally have good feelings, regardless of what happens outside and they will transfer this feeling and energy to their working place and its staff.

These psychological principles are the key concepts of quantum paradigm but they are not enough per se. The skills resulting from these three principles are basically self-centered.

They centralize individuals based on their objectives, capabilities and emotions and enable the members of an organization to materialize more capabilities (Shelton, 1999). Quantum center skills will appear in the quantum itself whose extract is creating an optimum relationship in an organization. Quantum relationships are a necessity to human transformation. Relationships will release an individual's capacities. This capability, will appear based on an unconditional positive and acceptance relationship (Shelton, 2010: 170).

Quantum relationships are psychological mirrors. People can see their reflections in it. This skill will enable principals to accept their feelings and not to attribute them to others. A leader, by doing this, will understand that relationships are the exceptional opportunities of learning and will attempt to imply to himself/herself that none of them will happen without any reasons. Moreover, an efficient leader will figure out that the most popular people are not always those who provide many things at their service, but those who provide valuable assistance to his/her mental and psychological health and eventually contribute to organizational efficacy (Shelton, & Darling, 2001: 271). The acts of organizing and administration require an effective relationship so that staff are aware of their objectives and roles. The relationship skills of administrators mean a skill in an ability to transfer and receive information, views and feelings from one person or source to another person or source. Using the science of administration and communications, principals will do their best to understand their perceptions and communication models, therefore; in order to change administration changes, they can develop effective skills in administration and facilitate organizational objectives (Nazari, Ehsani, Ganjavi & Ghasemi, 2012).

Therefore; communications comprise basis and foundation of administration and principals can fulfill their duties only by establishing effective communications with the individuals of an organization (Khosravi, Nazari & Saleki, 2016). According to Shelton & Darling (2003) principals and leaders can change to experts through using quantum skills and can contribute deeply to changing themselves and their organizations, as well. The leaders who have the courage to use these skills inside organizational processes and methods, will have methods beyond the inability to organizational learning and creating continuous learning in a way that they are continually changing themselves and their organizations internally and externally (Ghaedemini Harouni, Ebrahimzadeh Dastjerdi, Abdi & Sadeghi Deh Cheshmeh, 2018).

The quantum theory teaches us that change, is not merely an event, rather it consolidates the world. People cannot avoid this change, because it is happening everywhere, rather, they can impress the conditions and consequences of change (Malloch & Porter-O'Grady, 2009). When a correct understanding of the features of internet and the knowledge of how to effectively integrate internet technology with the most optimum and precious features of the experience of in-person learning are established, quantum change is then considered to have taken place from the nature and quality of educational experience perspectives (Garrison & Kanuka, 2004).

Therefore; blended learning is considered as quantum leap in educational strategies, ranging from in-person presentation to a synthesis of advanced traditional and technology (Georgina & Olson, 2008). And quantum leadership will culminate in creating considerable opportunities so that people cooperate with one another and contribute to an increase in synergy of performance (Papatya & Dulupcu, 2008).

Background of research

Learning in the recent decades has experienced important events, because knowledge and technology have been considerably transformed and this issue, has seriously challenged traditional learning (Johnson, 2015: 108). Hence; trainers should develop their teaching skills in

order to be in line with the present educational situation. Morris & Lim (2009) have pointed out that due to the advances of communications and network technologies, a more innovative presentation of learning called blended learning has emerged to present meaningful learning experiences for learners in educational places (Moukali, 2012). According to Garrison and Vaughan (2008), the main hypotheses of designing this blended learning are as follows: (a) combined thinking of in-person and online learning, (b) essential revision in designing a course to improve learners' participation and (c) restructuring and substituting contact hours of traditional classrooms (Vidergor & Sela, 2017).

Studies about technology leadership in the United States have begun since 1990 and since then it has become important. In order to have an experienced and capable technology leader, a principal should be trained in five fields: (1) perspective, planning and administration, (2) development and training of staff, (3) technical and infrastructural support, (4) evaluation and research, (5) interpersonal and communications skills (Chang, 2011). Hope & Sermon (1999) in their studies called leading the technology revolution: A new challenge to principals, three role models for principals, educational and perceptive leader and those principals as educational leaders are responsible for facilitating technology synthesis in the process of learning and teaching (Gosmire & Grady, 2007).

Adekola, Dale & Gardiner (2017) in their study on development of an institutional framework to guide transitions into enhanced blended learning in higher education, emphasize four factors with which principals can lead their organizations towards blended learning: change factors (including digital perspectives change, globalization, quality assurance and upgrading levels and expectations of beneficiaries), organizational considerations (organizational culture based on support and advocacy of technology in learning, administration and organization, encouraging staff through cognition and reward, assigning time for blended learning, continuous assessment of blended learning, technical and educational support requirements, establishing clear communications with learners, evidence of the roles of learners and teachers, supplementary roles of supporting staff to prevent confusion, strong and reliable infrastructures, considering ethical dimensions and legal or supervisory aspects such as privacy, plagiarism and copyright), organizational readiness for change (qualification, commitment, communications and cooperation) and the roles of beneficiaries (organizational co-direction and systematic discourse).

Murphy (2017) in his study, role of the principal in implementing blended learning in algebra I courses in South Carolina public schools, puts forward two major roles for a principal: principal as technology leader and principal as manager. Principal as a technology leader plays a role in successful integration and execution of blended learning courses. Leadership capability is a success factor in executing a new method. This dimension focuses mainly on the role of an administrator in developing trainers in executing centralized blended learning in the first place. The mission of a principal includes designing and executing new strategies to help trainers in understanding technology and utilizing it. Satisfying educational requirements of trainers for professional progress is of higher priority and principals should pursue to create opportunities to professionally develop trainers. In addition, technology leadership consists of establishing communications together with strong perceptions. Another role of a principal as technology leader is to be a role model. Moreover, a principal as manager plays a major role in successful execution of a blended learning course. Relationship pertaining to a principal as manager is about managing staff and using appropriate educational forces and hiring technical support staff in a manner that he/she can continuously help trainers in executing blended education courses. The duty of an admin principal instructor pertaining learners is to help constructively involving learners in the setting of blended learning. Successful principals learn to play their integrating roles as principals and leaders and understand the importance of both duties.

Thurab-Nkhosi (2018) in his studies on executing blended /online learning policy in a face-to-face atmosphere: principals' perspectives and their consequences for change, has studied principals' roles in three dimensions: strategy (providing a clear path, ensuring the existence of a common philosophy, coordination), structure (principals as role models, blended learning fans, information sharing) and support (resources mobilization, skills and equipment investigation, encouraging educational staff and learners).

Keshmiri & Moradi (2021) showed in a study on readiness for leading digital transformation in schools that digital perspectives indexes, digital literacy, mental agility, fast adaptation and learning indexes are major factors in creating readiness for leading digital transformation and in order to succeed in terms of digital transformation leadership, it would be better to consider strategy, culture, innovation and staff skills as rings around technology. Studies conducted show that in most researches done, roles of principals have been put forward in blended learning with a variety of approaches and it is important to perform kind of integration for the roles that this research considers necessary. Therefore; this study attempts to answer the following question with regards to the objective of the research: From quantum perspectives, what is the psychological and center role of principals in executing blended learning?

Research methodology

This research is of applied type in terms of objective, of qualitative type in terms of nature of information and manner of their analyses and of documentary research type in terms of information collection methods. Based on the research method, it is among descriptive-analytical research which was conducted using the meta-synthesis method. Meta-synthesis researches are organized methods for information management which provides extensive series of studies and through systematic studying and investigation of past researches and with the aim of creating deeper knowledge about subjects, attempts to address information and findings extracted from other qualitative studies related to relevant subjects so that by synthesizing them, a different and more complex summary would be provided (Means, Toyama, Murphy, & Baki, 2013; Dinçer, 2018). Sampling method is targeted and the statistical population of the research includes all the studies conducted in the recent 31 years which are related to the research topic, because blended learning in educational systems has been put forward for almost 31 years.

The selected criteria of the sample documents were their frequent printing in authoritative publications from 1990 to 2021 and the existence of indexes of principals' roles in blended learning in the research findings. In regards to these criteria, a number of 43 documents ranging from books, articles Ph.D. theses and M.S theses, reports and standards were obtained.

Sandelowski & Barroso (2007) method was used to carry out the research in meta-synthesis method which includes seven stages of adjusting questions, organized and systematic review of literature, search and selection of appropriate documents, information extraction, analysis and synthesis of findings, quality control and providing findings which will be addressed and continued in the following sections.

Stage 1-adjusting questions: The first step of meta-synthesis includes philosophical stance and imagining and designing questions about the main subject of the research. After setting goals, the initial parameters (what), society (who), time (when), method (how) were determined. These parameters form the selection criteria of documents and specify what studies should be set aside (Sandelowski & Barroso, 2007). The research questions appear in Table 1.

Table 1. Research questions

Determining factors	
(What)	From quantum paradigm perspectives, what are the psychological and center roles of principals in executing blended learning?
(Target study) Who	Books, articles and theses obtained from data bases and search engine including: Nourmagz, Irandoc, Iran Mag, University Jihad Scientific Information Center, Humanities Comprehensive Portal, Civilica, Google Scholar, Escopos, Emerald, Elsevier, ProQuest
(When) Time limitation	from 1990 to 2021
(How) methodology	Qualitative research

Stage 2- Organized and systematic reviewing of the literature: In this step, organized search of the existing documents in authoritative databases have been addressed. In regards to the research question in the initial search, such key words as blended learning, roles of principals in blended learning, combined learning, technological leadership in learning, impact of quantum management in blended learning, impact of quantum leadership in blended learning and role of principals in executing blended learning have been selected and have appeared in the scientific information databases in Table 1. And were searched during the recent 31 years.

Stage 3- search and selection of appropriate documents.

In the process of initial search in E-databases, 984 documents were obtained. At first, the documents whose titles and subjects were not in line with the research or they were repeated ones were deleted. Then the abstracts of 332 remaining documents were studied in terms of having the three initial criteria. These criteria include: (1) studies have been conducted about learning, (2) studies have pointed out principals' roles, (3) Studies have used the qualitative methods. As a result of this screening, 259 articles were maintained and complete screening of remaining 213 documents was done and finally, 43 articles were chosen for studying and coding. Figure 1 shows the number of screened resources in each stage.

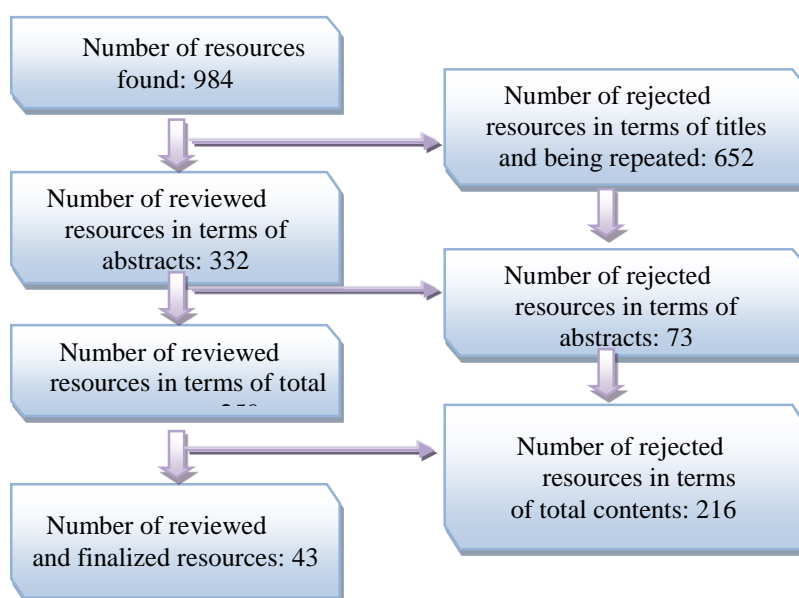


Figure 1. Number of screened resources in each stage

Stage 4- Extraction of documents information: In this step, selected documents were reviewed several times and the related parameters were categorized. Information of these

documents appears in Table 2 separately according to researcher's name, year of edition and type of document.

Table 2. Separate categorization of the selected documents according to researcher's name, year of edition, type of document and related parameters

Researchers	Year	Document type	related parameters
Jafarzadeh, Hosseini, Jahed & Abedi	2021	Article	Having perspectives and proper mission with learning, establishing communications throughout an organization using technology, changing learners' perception towards technology
Sadeghitabar & Shariatmadari	2021	Article	Executing policies pertaining copyright and intellectual property
Bokolo & et al	2020	Article	Supporting blended learning programs, appropriate operational planning, having perspectives and mission commensurate with blended learning, creating common perspectives, creating strategies commensurate with blended learning, preparing members for change
Thurab-Nkhosi	2018	Article	Creating common strategies, presenting clear direction, ensuring common philosophy, co-direction, principals as heroes, blended learning fan, information sharing, encouraging educational staff and learners, participation in learning, guiding trainers, paying attention to human talents
Holmes & Prieto-Rodriguez	2018	Article	Setting the stage to create proper understanding of learning management systems (LMS), setting the stage to create balance, attempts to maximize participation and learning, listening to others
Naderifar, Barkhordar, Dehkordi, Jalalodini & Ghaljaei	2018	Article	Having contradictory thinking, having continuous critical thinking, providing communications tools and techniques, setting the stage for interaction, discourse with one another to set the stage for cooperation
Ruckdeschel	2018	Article	Confronting challenges or obstacles, teaching strategies
Abdolhoseini, Abdollahi, Zaynabadi & Zarghami	2018	Article	Exploiting appropriate methods in using technology, having creativity, setting the stage for using both dimensions of learner-centric and network-centric learning
Sevari & Falahi	2017	Article	Creating active and resilient learning atmosphere
Murphy	2017	Article	Up-to-date planning, sharing members in planning, comparison and balancing technology program with other programs, supporting blended learning programs, exploiting appropriate methods in using technology, supporting proper support services, on-time and high quality exploitation of technology, executing policies pertaining copyright and intellectual property, pursuing subjects related to ethical matters, online privacy and security, ensuring fair access and use of technology,

			providing the needs of learners requiring special training in technology use, assisting the presentation of individual training programs for all learners
Adekola, Dale & Gardiner	2017	Article	Creating a strategy commensurate with blended learning, main mentor, clear support of innovation in learning and teaching, pursuing subjects pertaining ethical matters, online privacy and security, commitment increase, qualification and organizational awareness, giving independence to staff in blended learning, paying attention to the roles of beneficiaries, ensuring fair access and technology use, creating active and resilient learning atmosphere, establishing communications throughout an organization using technology
Haris, Afdaliah, Budiman & Haris	2016	Article	Having perspectives and mission commensurate with blended learning, having creativity, identifying potential opportunities, creating active and resilient learning atmosphere
Lim & Wang	2016 ^a	Article	Up-to-date planning, supporting blended learning programs, precise identification of the aims of a movement towards blended learning, revising values, norms and institutional protocols and updating policies, having perspectives and mission commensurate with blended learning, breaking the resistance against change, penetrating and participation in learning as leadership
Han & et al	2016	Article	Up-to-date planning, having perspectives and mission commensurate with blended learning, revising values, norms and institutional protocols and updating policies, preparing members for a change, (supporting) cooperation with learners, discourse to create the stage for cooperation
Lim & Wang	2016 ^b	Article	Sharing members in planning, appropriate operational planning, having perspectives and mission commensurate with blended learning, creating common perspectives, attempt to maximize participation and cooperation
Ranjit Singh	2016	Article	Supporting blended learning programs, having perspectives and mission commensurate with blended learning, creating a strategy commensurate with blended learning
Gibson, Broadley & Downie	2016	Article	Revising values, norms and institutional protocols and updating policies, having perspectives and mission commensurate with blended learning, main mentor, preparing members for a change, change management, supporting learners in using technology in blended courses
Oakley	2016	Article	Strategic planning, having perspectives and mission commensurate with blended learning,

			creating common perspectives, creating a strategy commensurate with blended learning, having creativity, change management, guiding teachers
Kundu, Bhar & Pandurangan	2016	Article	Quantum strategic planning, having contradictory thinking
Porter & et al	2015	Article	Supporting blended learning programs, precise identification of objectives of a movement towards blended learning, revising values, norms and institutional protocols and updating policies, presenting precise but resilient post-graduate programs, creating a strategy commensurate with blended learning, clear support of innovation in learning and teaching, supporting appropriate support services, on-time and high quality of technology, supporting learners in using technology in blended courses
Sadeghi Dehkordi & Moradi Pordanjani	2015	Article	Creating internal incentives and principals' welcoming of change and imbalance, localizing change
Johnson	2015	PhD thesis	Changing organizational culture
Acat & Ay	2014	Article	Setting the stage for using both brain-centric and network-centric dimensions in learning
Hillman	2013	PhD thesis	Preparing learners and taking over a guiding role, coordinator and facilitator, finding problems, paying equal attention to all the dimensions of in-person and out-person learning, on time attention to issues, (supporting) cooperation with learners, penetration and participation in learning as leadership, creating networked and web-based structures
Kaur	2013	Article	Having perspectives and mission commensurate with blended learning, creating common perspectives, presenting precise but resilient post-graduate programs, supporting appropriate support services, on-time and high quality of technology, setting the stage to create an appropriate understanding of learning management systems (LMS), interaction between teachers and learners, (supporting) cooperation with learners, providing communications tools and techniques
Smal	2013	PhD thesis	Having perspectives and mission commensurate with blended learning, having the creativity to confront challenges or obstacles
Sadeghi & Mohtashami	2012	Article	Main mentor, change management, supporting learners in using technology in blended courses
Massy	2012	Article	Creating common strategies, creating common perspectives, guiding teachers and managing blended learning parameters, changing organizational culture, paying equal attention to all the dimensions of in-person learning and tele-

			learning, robust designing and forming a ready facilitating team
Kumar	2012	Article	Creating creative balance between educational and technology curricula
Wallace & Young	2010	Article	Precise identification of the objectives of a movement towards blended learning, appropriate operational planning, determining the needs, determining the aims of a program, designing a blended program, creating individual training to execute programs, measuring results of a program, revising values, norms and institutional protocols and updating policies, presenting precise but resilient post-graduate programs, executing policies pertain copyright and intellectual property, supporting learners in using technology in blended courses
Wells	2009	Article	Creating common perspectives, special attention to human talents, discourse with one another to set the stage for cooperation
Gray	2007	Article	Appropriate operational planning, having perspectives and mission commensurate with blended learning, creating a roadmap for effective use of technology, guiding learners and parameters management of blended learning, supporting proper support services, on-time and high quality of technology, executing policies related to copyright and intellectual property, pursuing subjects pertaining ethical matters, online privacy and security, supporting learners in using technology in blended courses, setting as a role model for teachers, setting the stage for creating appropriate understanding of learning management systems, penetration and participation in learning as leadership
Wilson & Smilanich	2005	Book	Appropriate operational planning, determining needs, setting the objectives of programs, designing blended learning, creating individual training methods to execute programs, measuring results of a program, preparing members for a change, change management
Nourie	2005	Report	Creating a balanced atmosphere, providing communications tools and techniques
Leithwood, Seashore, Anderson & Wahlstrom	2004	Report	Precise identification of objectives of a movement towards blended learning, main mentor, guiding teachers and parameters management of blended learning, changing organizational culture, supporting appropriate support services, on-time and high quality of technology, creating resilient structures
Singer	2004	Master Thesis	Having perspectives and mission commensurate with blended learning, creating common perspectives, having continuous critical thinking, changing organizational culture, executing

			policies related to copyright and intellectual property
Garrison & Kanuka	2004	Article	Strategic planning, appropriate operational planning, creating a common strategy, creating strategies commensurate with blended learning, change management of confronting challenges and obstacles
Creighton	2003	Book	Breaking the resistance against change, preparing members for a change, setting a role model for teachers
Bielawski & Metcalf	2003	Book	Preparing learners and taking over the role of a mentor, coordinator and facilitator, on-time exploitation of accessible information, establishing communications throughout an organization using technology
Thorne	2003	Book	on-time exploitation of accessible information, confronting challenges and obstacles
TSSA	2001	Book	Having perspectives and mission commensurate with blended learning, guiding teachers and parameters management of blended learning, clear support of innovation in learning and teaching, supporting appropriate support services, on-time and high quality of technology, supporting learners in using technology in blended courses, setting a role model for teachers, paying attention to the roles of beneficiaries, setting the stage for creating appropriate understanding of learning management systems (LMS)
Shelton	1999	Article	Having contradictory thinking, spending time for thinking about how to achieve long-term objectives (not focusing on immediate results)
Boyd & Hord	1994	Article	Having perspectives and mission commensurate with blended learning, creating common strategies, probing into ideas, clear support of creativity in learning and teaching, having continuous critical thinking, breaking the resistance against change, preparing members for a change, changing organizational culture, commitment increase, qualification and organizational awareness, giving independence to staff in blended learning, paying attention to the roles of beneficiaries, providing communications tools and techniques, setting the stage for creating interaction, discourse with one another to set the stage of cooperation, establishing communications throughout an organization using technology, interaction between leaders and followers

Stage 5- Analysis and synthesis of qualitative findings: Finfgeld (2003) thinks that there are two common methods in analyzing the selected research findings. The first method is to analyze each article without considering a conceptual framework. The second method is to analyze

documents based on a pre-determined framework. In this method, there are pre-determined codes to analyze the combination of concepts and communications among them and researchers may begin with a list of codes before producing encrypted data. (Abedi Jafari & Amiri, 2019). In this research, the second method has been put to use and in regards to the dimensions of quantum skills regarding psychology and center fields, codes were categorized. This categorization appears in Table 3.

Table 3. Categorized parameters and indexes

Parameters (Category)	Indexes (Themes)	resources
planning	Up-to-date planning	Murphy (2017), Lim & et al (2016 a), Han & et al (2016), Wilson & Smilanich (2005)
	Sharing members in planning	Murphy (2017), Lim & et al (2016 b)
	Comparing and balancing technology program with other programs	Murphy (2017), Wilson & Smilanich (2005)
	Strategic planning	Thurab-Nkhosi (2018), Lim & et al (2016 a), Kundu, Bhar & Pandurangan (2016), Oakley (2016), Porter & et al (2015), Wallace & Young (2010), Gray (2007), Leithwood & et al (2004), Garrison & Kanuka (2004)
	Operational planning	Bokolo & et al (2019), Lim & et al (2016 b), Wallace & Young (2010), Gray (2007), Wilson & Smilanich (2005), Garrison & Kanuka (2004)
	Revising values, norms and institutional protocols and updating policies	Jafarzadeh& et al (2021), Lim & et al (2016 a), Han & et al (2016), Gibson & et al (2016), Porter & et al (2015), Wallace & Young (2010)
	Changing perception of teachers towards technology	Jafarzadeh& et al (2021), Ruckdeschel (2018)
	Presenting precise but resilient post-graduate programs	Porter & et al (2015), Kaur (2013), Wallace & Young (2010)
Effective and informed leadership	Having perspectives and mission commensurate with blended learning	Jafarzadeh& et al (2021), Bokolo & et al (2019), Haris & et al (2016), Lim & et al (2016 a), Lim & et al (2016 b), Han & et al (2016), Ranjit Singh (2016), Gibson & et al (2016), Oakley (2016), Kaur (2013), Smal (2013), Gray (2007), Singer (2004), TSSA (2001), Boyd & Hord (1994)
	Creating common perspectives	Bokolo & et al (2019), Thurab-Nkhosi (2018), Lim & et al (2016 b), Oakley (2016), Kaur (2013), Massy (2012), Wells (2009), Gray (2007), Singer (2004), Garrison & Kanuka (2004)
	Creating a strategy commensurate with blended learning	Bokolo & et al (2019), Adekola, Dale & Gardiner (2017), Ranjit Singh (2016), Oakley (2016), Porter & et al (2015), Garrison & Kanuka (2004)
	Creating common strategy	Thurab-Nkhosi (2018), Boyd & Hord (1994) (2015), Sadeghi & Mohtashami (2012)

	Participation in learning and taking over the role of a mentor, coordinator and facilitator	Thurab-Nkhosi (2018), Lim & et al (2016 a), Hillman (2013), Gray (2007), Bielawski & Metcalf (2003)
	Guiding teachers and parameters management of blended learning	Thurab-Nkhosi (2018), Adekola, Dale & Gardiner (2017) Oakley (2016), (2015), Sadeghi & Mohtashami (2012), Massy (۲۰۱۲), Gray (2007), Leithwood & et al (2004), TSSA (2001)
Confronting challenges and obstacles	Finding problems	Hillman (2013)
	Confronting challenges and obstacles	Ruckdeschel (2018), Smal (2013), Garrison & Kanuka (2004), Thorne (2003)
Creative thinking	Having creativity and probing into ideas	Abdolhoseini & et al (2018), Haris & et al (2016), Oakley (2016), Smal (2013), Boyd & Hord (1994)
	Establishing creative balance between curricula and technology	Kumar (2012)
	Clear support of innovation in learning and teaching	Adekola, Dale & Gardiner (2017), Porter & et al (2015), TSSA (2001), Boyd & Hord (1994)
	Having contradictory thinking	Naderifar & et al (2018), Kundu, Bhar & Pandurangan (2016), Shelton (1999)
	Having continuous critical thinking	Naderifar & et al (2018), Singer (2004), Boyd & Hord (1994)
Change management	Welcoming change and unpredictable situations	Oakley (2016), Garrison & Kanuka (2004)
	Breaking resistance against change	Lim & et al (2016 a), Creighton (2003)
	Preparing members for a change	Bokolo & et al (2019), Han & et al (2016), Gibson & et al (2016), (2015), Sadeghi & Mohtashami (2012). Wilson & Smilanich (2005), Creighton (2003), Boyd & Hord (1994)
	Changing organizational culture towards participation	Johnson (, (۲۰۱۰) Massy (2012), Leithwood & et al (2004), Singer (2004), Boyd & Hord (1994)
	Creating internal incentives and principals' welcoming change and imbalance	Sadeghi Dehkordi & Moradi Pordanjani (2015)
	Localization of change	Sadeghi Dehkordi & Moradi Pordanjani (2015)
Comprehensive thinking	Paying equal attention to all the dimensions of in-person and tele-learning	Hillman (2013), Massy (2012)

	Spending enough time to think about how to achieve long-term objectives of blended learning (not focusing on immediate results)	Shelton (1999)
Accountability	Supporting blended learning programs	Bokolo & et al (2019), Thurab-Nkhosi (2018), Murphy (2017), Lim & et al (2016 a), Ranjit Singh (2016), Porter & et al (2015)
	Supporting appropriate support services, on-time and high quality	Murphy (2017), Porter & et al (2015), Kaur (2013), Gray (2007), Leithwood & et al (2004), TSSA (2001)
	Robust designing and forming ready facilitating team	Massy (2012)
	Ensuring fair access and use of information	Murphy (2017), Adekola, Dale & Gardiner (2017)
Supporting individuals' rights and security	Executing policies pertaining copyright and intellectual property	Sadeghitabar & Shariatmadari (2021), Murphy (2017), Wallace & Young (2010), Gray (2007), Singer (2004)
	Pursuing subjects pertaining ethical matters, online privacy and security	Murphy (2017), Adekola, Dale & Gardiner (2017), Gray (2007)
	Supporting learners in using technology in blended courses	Han & et al (2016), Gibson & et al (2016), Porter & et al (2015), Sadeghi, & Mohtashami (2012), Kaur (2013), Hillman (2013), Wallace & Young (2010), Gray (2007), TSSA (2001)
Respecting values	Possessing commitment, qualification and organizational awareness	Adekola, Dale & Gardiner (2017), Boyd & Hord (1994)
	Being a role model for teachers	Thurab-Nkhosi (2018), Gray (2007), Creighton (2003), TSSA (2001), TSSA (2001)
Paying attention to needs and talents	Giving independence to staff in blended learning	Adekola, Dale & Gardiner (2017), Boyd & Hord (1994)
	Paying attention to beneficiaries	Adekola, Dale & Gardiner (2017), TSSA (2001), Boyd & Hord (1994)
	Special attention to human talents	Thurab-Nkhosi (2018), Wells (2009)
	Satisfying learners' needs requiring special training in using technology	Murphy (2017)
	Helping to present individual training programs for all	Murphy (2017), Wallace & Young (2010), Wilson & Smilanich (2005)

	learners	
Exploiting process of information	On-time exploitation of accessible information	Thurab-Nkhosi (2018), Bielawski & Metcalf (2003), Thorne (2003)
	Identifying potential opportunities	Haris & et al (2016),
	On-time attention to issues	Hillman (2013)
Creating an appropriate learning space	Creating an active and resilient learning space	Sevari & Falahi (2017), Adekola, Dale & Gardiner (2017), Haris & et al (2016)
	Creating an atmosphere of excellence	Nourie (2005)
	Setting the stage to create appropriate understanding of learning management systems	Holmes & Prieto-Rodriguez (2018), Gray (2007), TSSA (2001)
	Exploiting appropriate solutions in using technology	Abdolhoseini & et al (2018), Murphy (2017)
Establishing appropriate communications	Providing communications tools and techniques	Naderifar & et al (2018), Kaur (2013), Nourie (2005), Boyd & Hord (1994)
	Setting the stage to create balance	Holmes & Prieto-Rodriguez (2018), Naderifar & et al (2018), Kaur (2013), Boyd & Hord (1994)
	Attempt to maximize participation and learning	Holmes & Prieto-Rodriguez (2018), Lim & et al (2016 b)
	Listening to others	Holmes & Prieto-Rodriguez (2018)
	Discourse to create a cooperative setting	Naderifar & et al (2018), Han & et al (2016), Wells (2009), Boyd & Hord (1994)
	Establishing communications throughout an organization using technology	Jafarzadeh& et al (2021), Adekola, Dale & Gardiner (2017), Bielawski & Metcalf (2003), Boyd & Hord (1994)
Creating network-centric and resilient structure	Creating networked and web-based structure	Hillman (2013)
	Creating resilient structures	Leithwood & et al (2004)
	Setting the stage to use both brain-centric and network-centric dimensions in learning	Abdolhoseini & et al (2018), Acat & Ay (2014)

Stage 6- quality assurance: Sandelowski & Barroso (2007) introduces four validities for meta-synthesis in order to have quality assurance and ensure the validity of research. Descriptive

validity: identifying all the related reports and recognizing indexes of each report. Interpretive validity: complete presentation of perception and viewpoints of researchers about the reports. Theoretical validity: reliability of the methods that a researcher has used to integrate and interpret research findings. Pragmatic validity: investigating the suitability, feasibility of knowledge transfer, application and suitability of meta-synthesis (Mohammadi, Saberi, Salimi & Nouri, 2018). In this research, expert consultation has been sought for theoretical and pragmatic validity. In descriptive validity, independent assessment of two researchers were used, as well. In order to increase validity and reliability, documents were reviewed and separately coded by two university lecturers, the percentage of agreement between two coding persons was calculated using the formula proposed by (Miles and Huberman, 1994). (reliability = number of agreements / total number of agreements + disagreements) were identified, therefore; it can be stated that the coding is reliable enough.

Stage 7- presenting the findings: In response to the research question posed on the psychological and center roles of principals in executing blended learning from quantum paradigms, findings from 14 parameters in the format of four dimensions were used. This categorization appears in Table 4.

Table 4. Dimensions and parameters of psychological and central role of principals in implementing

principal roles	Dimensions of quantum	parameters
psychological	Quantum seeing	planning
		Effective and informed leadership
		Confronting challenges and obstacles
	Quantum thinking	Creative thinking
		Change management
		Comprehensive thinking
	Quantum feeling	Accountability
		Supporting individuals' rights and security
		Respecting values
Paying attention to needs and talents		
center	Quantum being	Exploiting process of information
		Creating an appropriate learning space
		Establishing appropriate communications
		Creating network-centric and resilient structure

Discussion and conclusion

Since the present research was conducted with the aim of identifying dimensions and parameters of psychological and center roles in executing blended learning from quantum paradigm, the obtained parameters were categorized into two psychological and center roles and based on Shelton theory (1999), the principals' psychological roles were investigated in three dimensions of quantum seeing, quantum thinking and quantum feeling and their center roles in the quantum being dimensions were also reviewed.

In the quantum seeing dimension, the parameters of planning, informed and effective leadership and confronting challenges and removing obstacles were extracted from the investigated documents. Jafar Zadeghan et.al (1399), BoKolo et.al (2019), Thurab-Nkhosi (2018), Ruckdeschel (2018), Adekola, Dale & Gardiner (2017), Murphy (2017), Lim & et al (2016 a), Lim & et al (2016 b), Han & et al (2016), Kundu, Bhar & Pandurangan (2016), Gibson & et al (2016), Haris, & et al (2016), Ranjit Singh (2016), Oakley (2016), Porter & et al (2015),

Hillman (2013), Kaur (2013), Smal (2013), Massy (2012), Sadeghi & Mohtashami (2012), Wallace & Young (2010), Wells (2009), Gray (2007), Wilson & Smilanich (2005), Leithwood & et al (2004), Garrison & Kanuka (2004), Leithwood & et al (2004), Singer (2004), Bielawski & Metcalf (2003), Thorne (2003), TSSA (2001), Boyd & Hord (1994), pointed out the indexes of this domain in their studies.

What can be concluded from the aggregation of the results of various documents and studies is that principals should be aware of their aims to execute blended learning and in regards to the views of all the members, they should codify the best and most updated programs. Codifying such programs necessitates preparing perspectives, mission and proper strategies commensurate with learners and staff's demands. In case of the members' participation in this regard, their perceptive power of seeing will be optimized and they will be able to create new opportunities in the execution of better blended learning. Chang (2011) has also pointed out in his studies, to perspectives, planning and management and Adekola, Dale and Gardiner (2017) believe that perspective change can lead an organization towards blended learning. Thurab-Nkhosi (2018) points out to a common philosophy and co-direction in the clear strategy dimension and in Murphy's views (2017), leadership capability of principals is an important factor in the success of an educational organization in executing blended learning methods and that a principal's mission includes designing and executing new strategies to help teachers in understanding technology and its utilization. Keshmiri & Moradi (2021) pointed out to codifying perspectives and strategies based on technology in order to prepare for transformation leadership in the domain of technology.

In the dimension of quantum thinking, parameters of creative thinking, change management and comprehensive thinking were extracted from the reviewed documents. Bokolo & et al (2019), Naderifar & et al (2018), Abdolhoseini & et al (2018), Adekola, Dale & Gardiner (2017), Haris & et al (2016), Lim & et al (2016 a), Oakley (2016), Kundu, Bhar & Pandurangan (2016), Han & et al (2016), Gibson & et al (2016), Johnson (2015), Porter & et al (2015), Sadeghi Dehkordi & Moradi Pordanjani (2015), Hillman (2013), Smal (2013), Kumar (2012), Massy (2012), Sadeghi & Mohtashami (2012). Wilson & Smilanich (2005), Garrison & Kanuka (2004), Leithwood & et al (2004), Singer (2004), Singer (2004), Creighton (2003), TSSA (2001), Shelton (1999), Boyd & Hord (1994), pointed out the indexes of this domain in their studies.

Quantum administration welcomes change and believe that in order to provide blended learning setting after creating quantum seeing, principals should have the morale of welcoming change and encourage staff and learners to create and adopt the change. Without having a contradictory, critical, creative and comprehensive thinking, any change of approach from traditional to blended will be very difficult. Garrison and Vaughan (2008) also consider change of thinking, fundamental revision and restructuring as necessary to create blended learning setting, (Videgor and Sela 2008), Adekola Dale and Gardiner (2017) emphasize organizational readiness.

In the quantum feeling dimension, accountability parameters, supporting rights and security of individuals, respecting values, attention to needs and talents and exploiting the process of information were extracted from the investigated documents. Sadeghitabar & Shariatmadari (2021), Bokolo & et al (2019), Thurab-Nkhosi (2018), Adekola, Dale & Gardiner (2017), Murphy (2017), Han & et al (2016), Haris & et al (2016), Gibson & et al (2016), Lim & et al (2016 a), Ranjit Singh (2016), Porter & et al (2015), Hillman (2013), Kaur (2013), Massy (2012), Sadeghi, & Mohtashami (2012), Wallace & Young (2010), Wells (2009), Gray (2007), Wilson & Smilanich (2005), Leithwood & et al (2004), Singer (2004), Creighton (2003), Bielawski & Metcalf (2003), Thorne(2003), TSSA (2001), Boyd & Hord (1994), pointed out the indexes of this domain in their studies.

In quantum feeling, negative emotions (stress) are diminishing and positive emotions (love, care, kindness and appreciation) are invigorating forces of the body. The quantum feeling skills enable principals, regardless of external events, to have good feeling internally. Seeing negative events from positive aspect, certainly requires thinking in a contradictory manner (Shelton & Darling, 2001; Darling & Walker, 2001:56) and it is seeing an opportunity in the heart of threats.

The quantum feeling skill enables leaders to transform their structures. This skill has numerous effects on such issues as motivation, fatigue, stress and job satisfaction. If people, particularly principals, free themselves from dependence on external rewards and take responsibility for bringing proposal, creating passion, eagerness and joy to their organizations, the organizational life will be dramatically transformed (Shelton and Darling, 2001:268).

Sermon & Hope (1999) put forward three roles for principals as role model, educational and perceptive leader in their studies (Gosmire & Grady, 2007). Adekola, Dale and Gardiner (2017) put forward the role of principals in the quantum feeling dimension as organizational considerations. Thurab-Nkhosi (2018) has mentioned examples of quantum feeling in structure and support dimension and describes principals as role models, supportive of blended learning and encouraging staff and believes that in an educational organization, information should be shared and Murphy (2017) also considers being a role model as one of the roles of a principal.

The roles of principals in quantum center skills ends up in being (existence) dimension. In quantum being dimension, parameters of creating appropriate learning atmosphere, establishing effective communications and creating resilient and network-centric structure were extracted from reviewed documents. Jafarzadeh & et al (2021), Abdolhoseini & et al (2018), Holmes & Prieto-Rodriguez (2018), Naderifar & et al (2018), Adekola, Dale & Gardiner (2017), Murphy (2017), Sevari & Falahi (2017), Han & et al (2016), Haris & et al (2016), Lim & et al (2016 b), Acat & Ay (2014), Hillman (2013), Kaur (2013), Wells (2009), Gray (2007), Nourie (2005), Leithwood & et al (2004), Bielawski & Metcalf (2003), TSSA (2001), Boyd & Hord (1994), pointed out the indexes of this domain in their studies.

In order to exploit quantum being in an organization, principals should change priorities of their organization upside down, consider time and space for discourse and ensure that improving relationships will culminate in better results. Therefore; principals should discard obsolete mental framework and change to capable pioneers so that they could change their organization and themselves, as well (Shelton & Darling, 2001:271). Relationships are exceptional opportunities for learning, particularly in blended learning in which technology contributes to establishing this communication and makes it more widespread and resilient in terms of time and space and it provides the possibility of network-centric learning, therefore; perhaps it can be stated that the main role of principals is to pave the way for the setting of communications for learners and teachers.

Adekola, Dale & Gardiner (2017) pointed out to establishing clear communications with learners, creating active and resilient learning atmosphere and systematic discourse, as well.

Chang (2011) mentioned interpersonal and communications skills in his studies, as well. In his views, administration in an educational system is not a closed circuit system, but rather a dynamic educational ecology. Principals can no longer ignore the impacts of technology development outside an educational organization and whereas face a fast changing world. Therefore; the role of a principal has changed from administration to a multi-faceted role and technology leader. Hence; the most important duty of a principal is to understand how to have a proper technology leadership and how to guide his/her staff to improve technological literacy and the ability to exploit technology and improve educational efficacy and scholastic achievements.

In line with technological developments, an educational system should certainly take quick steps towards changing educational culture and exploiting blended learning. Perhaps if the

present situation resulting from the outbreak of a pandemic virus and limitation of learners' movement had not happened, type of seeing and thinking of certain principals would not have changed in the interests of creating and expanding blended learning. Principals who try to make decisions in any linear or logical manner using binary thinking systems and hardly exploit creative capabilities, but anyway it is necessary to conduct other studies, taking a society culture into considerations and achieve local solutions related to the role of principals in the execution of blended learning, because most conducted studies are not domestic and they essentially do not pay much attention to a society's culture and its role in the method of executing blended learning.

References

- [1] Abdolhoseini, B., Abdollahi, B., Zaynabadi, H. R., & Zarghami, S. (2018). Identifying the dimensions and behavioral indicators of school principals in the context of quantum paradigm: qualitative research. *Journal of School Administration (Jsa)*, 5(2), 173-191.
- [2] Abedi Jafari, A., & Amiri, M. (2019). Meta-Synthesis as a Method for Synthesizing Qualitative Researches. *Methodology of Social Sciences and Humanities (MSSH)*, 25(99), 73-87.
- [3] Acat, M. B. & Ay, Y. (2014). An Investigation the Effect of Quantum Learning Approach on Primary School 7th Grade students' Science Achievement, Retention and Attitude. *Educational Research Association the International Journal of Research in Teacher Education*, 5(2), 11-23.
- [4] Adekola, J., Dale, V. H., & Gardiner, K. (2017). Development of an institutional framework to guide transitions into enhanced blended learning in higher education. *Research in Learning Technology*, 25.
- [5] Bailey, J., Ellis, S., Schneider, C., & Vander Ark, T. (2013). Blended learning. Retrieved from <http://digitallearningnow.com/site/uploads/2014/05/DLN-ebook-PDF.pdf>
- [6] Bielawski, L., & Metcalf, D. S. (2003). Blended eLearning: Integrating knowledge, performance, support, and online learning. *Human Resource Development*.
- [7] Bokolo Jr, A., Kamaludin, A., Romli, A., Mat Raffei, A. F., A/L Eh Phon, D. N., Abdullah, A., ... & Baba, S. (2020). A managerial perspective on institutions' administration readiness to diffuse blended learning in higher education: Concept and evidence. *Journal of Research on Technology in Education*, 52(1), 37-64.
- [8] Bourdon, M. (2014). Lifelong learning from the '70s to Erasmus for all: A rising concept. *Social and Behavioral Sciences*, 116: 3005-3009.
- [9] Boyd, V., & Hord, S. M. (1994). *Principals and the New Paradigm: Schools as Learning Communities*.
- [10] Chang, I. H. (2011). The effect of principals' technological leadership on teachers' technology literacy and teaching effectiveness in Taiwanese elementary schools. *Educational Technology & Society*, 15 (2), 328-340.
- [11] Creighton, T. (2003). *The principal as technology leader*. Corwin Press.
- [12] Darling, J.R. & Walker w. (2001). Effective Conflict Management: Use of the Behavioral style model, leadership and *Organizational Development Journal*, 22 (5), 230- 242.
- [13] Dinçer, S. (2018). Content Analysis in Scientific Research: Meta-Analysis, Meta-Synthesis, and Descriptive Content Analysis. *Bartın University Journal of Faculty of Education*, 7(1), 176-190.
- [14] Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The internet and higher education*, 7(2),

- 95-105.
- [15] Georgina, D. A., & Olson, M. R. (2008). Integration of technology in higher education: A review of faculty self-perceptions. *The Internet and Higher Education*, 11(1), 1-8.
- [16] Ghaedemini Harouni, A., Ebrahimzadeh Dastjerdi, R., Abdi, H., & Sadeghi Deh Cheshmeh, M. (2018). The Impact of Quantum Leadership on Commitment to Change through Perceived Communication Quality of Change and Readiness for Change. *Educational Leadership and Management Research*, 4 (15), 1-1.
- [17] Gibson, D., Broadley, T. & Downie, J. (2016). Blended Learning in a Converged Model of University Transformation, *Blended Learning for Quality Higher Education: Selected Case Studies on Implementation from Asia-Pacific*, the United Nations Educational, Scientific and Cultural Organization.
- [18] Gosmire, D., & Grady, L. (2007). A bumpy road: Principal as technology leader. *Principal Leadership*, February, Retrieved from <https://www.nassp.org/portals/0/content/55193.pdf>
- [19] Gray, D., J. (2007). Implications of quantum theory on education: a critical review of the literature. *International Journal of Innovation and Sustainable Development*, 2(3-4), 315-331.
- [20] Han, X., Wang, Y., Li, B. & Cheng, J. (2016). Case Study of Institutional Implementation of Blended Learning at Five Universities in China, *Blended Learning for Quality Higher Education: Selected Case Studies on Implementation from Asia-Pacific*. the United Nations Educational, Scientific and Cultural Organization.
- [21] Haris, I., Afdaliah, Budiman, A., & Haris, K. (2016). Exploring Quantum Perspective in School Leadership: A Review of Effective Principal Leadership in the Changing Nature of School Management. *International Journal of Social Sciences & Educational Studies*, 2(4), 38-53.
- [22] Hawkins, K. M. (2005). The Principal as Technology Leader. *NAESP: National Association of Elementary School Principals*, 21(2), 1-4.
- [23] Hillman, J. T. (2013). Supporting the Growth of Principals as Instructional Leaders: An Interpretive Study about the New Work of School Leaders, (Doctoral dissertation, Wayne State University).
- [24] Holmes, K. A., & Prieto-Rodriguez, E. (2018). Student and staff perceptions of a learning management system for blended learning in teacher education. *Australian Journal of Teacher Education (Online)*, 43(3), 21-34.
- [25] Jafarzadeh, M. R., Hosseini, S. A., Jahed, H., & Abedi, S. (2021). The Application of Blended Learning in Higher Education from Teacher's Perspective. *Higher Education Letter*, 13(52), 95-123.
- [26] Johnson, E. (2015). Emergent Leadership Development: A New Model of Generative Growth and Learning (Doctoral dissertation, The Chicago School of Professional Psychology).
- [27] Kaur, M. (2013). Blended learning-its challenges and future. *Procedia-social and behavioral sciences*, 93, 612-617.
- [28] Keshmiri, S., & Moradi, S. (2021). Preparing to lead the digital transformation in schools. *Jsa*, 9 (1).
- [29] Khosravi, S., Nazari, R., & Saleki, M. (2016). Providing the Model of Communicative Skills Effectiveness on the Quantum Management Model of Managers and its Role on Organizational Agility of Sport Organizations. *International Journal of Humanities and Cultural Studies (IJHCS) ISSN 2356-5926*, 1(1), 545-555.
- [30] Kocak, R. D. (2020). A Perspective to 21st Century Management: Quantum

- Leadership. In *Academic Studies* (p. 318).
- [31] Kumar, A. (2012). Blended learning in higher education: A comprehensive study. In *Proceedings of International Conference on Business*.
- [32] Kundu, N., Bhar, C., & Pandurangan, V. (2016). *Managing Technology in Quantum Age*.
- [33] Leithwood, K., Seashore, K., Anderson, S., & Wahlstrom, K. (2004). *Executive Summary: Review of Research: How Leadership Influences Student Learning*. Commissioned by: The Wallace Foundation.
- [34] Lim, Ch. P. & Wang, T. (2016a). *A Framework and Self-Assessment Tool for Building the Capacity of Higher Education Institutions for Blended Learning*, *Blended Learning for Quality Higher Education: Selected Case Studies on Implementation from Asia-Pacific*. The United Nations Educational, Scientific and Cultural Organization.
- [35] Lim, Ch. P. & Wang, T. (2016b). *Professional Development for Blended Learning in a Faculty: A Case Study of the Education University of Hong Kong*, *Blended Learning for Quality Higher Education: Selected Case Studies on Implementation from Asia-Pacific*. The United Nations Educational, Scientific and Cultural Organization.
- [36] Malloch, K., & Porter-O'Grady, T. (2009). *The quantum leader: Applications for the new world of work*. Jones & Bartlett Learning.
- [37] Massy, J. (2012). The integration of learning technologies into Europe's education and training systems. *Handbook of blended learning: Global perspectives, local designs*, 419-431.
- [38] Means, B., Toyama, Y., Murphy, R., & Baki, M. (2013). The effectiveness of online and blended learning: A meta-analysis of the empirical literature. *Teachers college record*, 115(3), 1-47.
- [39] Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. sage.
- [40] Mohammadi, M., Saberi, M., Salimi, G., & Nouri, N. (2018). A Practical Guide to Meta-Synthesis Method for Identifying Professional Competencies of Teachers in Teaching Nature of Science. *Journal of Curriculum Studies*, 13(50), 75.
- [41] Moradi Mokhles, H., Mehdizadeh, H. & Emadi, S. R., (2011). E-learning bridge to transition from chain learning to lifelong learning, 4th Media Engineering Conference, Tehran, <https://civilica.com/doc/162413>
- [42] Mossavar-Rahmani, F., & Larson-Daugherty, C. (2007). Supporting the hybrid learning model: A new proposition. *MERLOT Journal of Online Learning and Teaching*, 3(1), 67-78.
- [43] Moukali, K. H. (2012). *Factors that affect faculty attitudes toward adoption of technology-rich blended learning* (Doctoral dissertation, University of Kansas).
- [44] Mousavi, S. A. (2018). *Comparison of the Effect of Linear and Non-Linear Blended Learning on the Academic Achievement of the 7th grade Students in Science lesson of Andimeshk junior high school*, thesis for master's degree, supervised by Seyed Abbas Razavi, Shahid Chamran University of Ahvaz, Faculty of Educational Sciences and Psychology.
- [45] Murphy, C. J. (2017). *Role of the Principal in Implementing Blended Learning in Algebra I Courses in South Carolina Public Schools*. (Doctoral dissertation). Retrieved from <https://scholarcommons.sc.edu/etd/4184>
- [46] Naderifar, M., Barkhordar, M., Dehkordi, S. N., Jalalodini, A., & Ghaljaei, F. (2018). The role of quantum skills in conflict resolution in educational organizations: A review article. *Journal of Advances in Medical Education (JAMED)*, 1(2).
- [47] Nazari, R., Ehsani, M., Ganjavi, F., & Ghasemi, H. (2012). *The Effects of*

- Communication Skills and Interpersonal Communication on the Organizational Effectiveness of Iranian Sport Managers and Modeling. *Sports Management Studies*, 16(4), 157-74.
- [48] Nourie, S. S. (2005). Professional Development & Student Achievement Programs. Research and Studies, www.Quantum Learning education.com.
- [49] Oakley, G. (2016). From Diffusion to Explosion: Accelerating Blended Learning at the University of Western Australia, *Blended Learning for Quality Higher Education: Selected Case Studies on Implementation from Asia-Pacific*. The United Nations Educational, Scientific and Cultural Organization.
- [50] Papatya, G., & Dulupçu, M. A. (2008). Thinking quantum leadership for true transformation: the talisman of “not to know” at the threshold of new leadership. *International Joint Symposium on Business Administration*. (1-3 Haziran), 19.
- [51] Porter, W. W., Graham, C. R., Bodily, R. G., & Sandberg, D. S. (2016). A qualitative analysis of institutional drivers and barriers to blended learning adoption in higher education. *The internet and Higher education*, 28, 17-27.
- [52] Ranjit Singh, T. K. (2016). Blended Learning Policies in Place at University Sains Malaysia, *Blended Learning for Quality Higher Education: Selected Case Studies on Implementation from Asia-Pacific*. The United Nations Educational, Scientific and Cultural Organization.
- [53] Ruckdeschel, S. (2018). *The Efficacy of Blended Learning Models of Teacher Professional Development*, Literacy Solutions and more, Inc. New York, USA.
- [54] Sadeghi Dehkordi, S., Moradi Pordanjani, H. A. (2015). The Relationship between the Quantum Skills and Chaos Management (Case study: Educational Managers in Shahrekord), *Journal of Applied Environmental and Biological Sciences*, 5(10), 222-232.
- [55] Sadeghi, Z., & Mohtashami, R. (2012). The role of distributed leadership in learning quality improvement. *Education Strategies in Medical Sciences*, 5(3), 207-214.
- [56] Sadeghitabar, P., & Shariatmadari, M. (2021). Identification of the Dimensions and Components of Continuing Medical Education Based on Blended Learning with Sustainable Development Approach. *Environmental Education and Sustainable Development*, 9(2), 63-82.
- [57] Sandelowski, M., & Barroso, J. (2007). *Handbook for synthesizing qualitative research*. New York: Springer.
- [58] Sevari, K., & Falahi, M. (2017). Develop and improve teaching and learning through blended learning teaching development and improvement through blended learning. *Journal of Educational Studies*, 10, 20-26.
- [59] Shelton, C. (1999). *Quantum leaps: 7 skills for workplace recreation*. Routledge.
- [60] Shelton, C. (2010). Spirituality, mental health and the new physics. *International Journal of Applied Psychoanalytic Studies*, 7(2): 161-171.
- [61] Shelton, C. K., & Darling, J. R. (2001). The quantum skills model in management: a new paradigm to enhance effective leadership. *Leadership & Organization Development Journal*, 22(6):264-273.
- [62] Singer, M. D. (2004). *Shifting Worlds: Leading Educational Change in a Quantum Universe*. (Doctoral dissertation, University of New Hampshire).
- [63] Smal, E. (2013). *Challenges of the health care unit manager as leader-manager in the 21st century, the Quantum Age*. (Doctoral dissertation, University of South Africa, Pretoria).
- [64] Stacey, R. (2003). *Management on the Unknown: Strategic Boundaries between Order and chaos in organizations*, translated by Mohsen Ghadami and Masoud Niazmand,

- Second Edition, Tehran: Higher Institute of Management Education and Research and Planning
- [65] Thorne, K. (2003). *Blended Learning: How to Integrate Online and Traditional Learning*. London: Korgan Ltd.
- [66] Thurab-Nkhosi, D. (2018). Implementing a blended/online learning policy on a face-to-face campus: Perspectives of administrators and implications for change. *Journal of Learning for Development*, 5(2), 133-147.
- [67] T. S. S. A., Collaborative (2001). *The Principal as Technology Leader*. corwin.com
- [68] Vidergor, H. E., & Sela, O. (2017). *Blended Learning Environments Higher Education. Innovative Teaching Strategies and Methods Promoting Lifelong Learning in Higher Education*, 85.
- [69] Wallace, L., & Young, J. (2010). Implementing blended learning: Policy implications for universities. *Online Journal of Distance Learning Administration*, 13(4), 7.
- [70] Wells, C. M. (2009). Leadership, quantum mechanics, and the relationship with professional learning communities. Retrieved from the Connexions Web site: [http://cnx.org/content, \(24349\): 1-8](http://cnx.org/content/(24349):1-8).
- [71] Wilson, D., & Smilanich, E. M. (2005). *The other blended learning: a classroom-centered approach*. John Wiley & Sons.

**COPYRIGHTS**

© 2022 by the authors. Licensee PNU, Tehran, Iran. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution 4.0 International (CC BY4.0) (<http://creativecommons.org/licenses/by/4.0>)