Comprehensive Journal of Science
Volume (10), Issue (39), (March, 2026)
ISSN: 3014-6266

مجلة العلوم الشاملة
المجلد (10) العدد 39 مارس 2026
ردمد: 3014-6266

The semantics of teachers' knowledge and students' multiple intelligences

I have always believed that the heart of the Multiple Intelligence perspective—in theory and in practice—inheres in taking human differences seriously. —Howard Gardner

Donia Assayad Elkwash,
Assistant Lecturer, Department of Physical Education, Faculty of Arts and Education, Sabratha University, Libya.
Email: dunya.alkawash@sabu.edu.ly

تاريخ الاستلام:2026/01/03 –تاريخ المراجعة: 2026/01/23– تاريخ القبول: 2026/01/30– تاريخ للنشر :2026/02/25

1. Introduction

The intelligences involve *semantics*—understanding the meaning of words. Also they involve *phonology*—the sounds and their interaction with each other and *syntax*—the syntactic rules, which allow teachers to engage students in problem solving and enables them to demonstrate understanding through performance assessment.

In recent years, knowledge sharing has been identified as a major focus area for knowledge management. Efforts will be made to identify the most effective ways to share knowledge, as a step towards improving organizational performance. Various factors have been identified as impediments for knowledge sharing, including inadequate organizational structures, unfriendly organizational sharing cultures, and insufficient technological support in this striving.

Gardner[1] sought to redefine the concept by incorporating recent findings from neuropsychology. He put forth the view that the intelligence quotient (IQ) does not adequately encompass the vast array of human abilities and that it misses important areas of intelligence.

1 Linguistic Intelligence refers to expressing and communicating ideas. This intelligence involves semantics—understanding the meaning of words; phonology—the sounds and their interaction with each other; and syntax—the rules governing the order of words and the pragmatic functions of different communications. Poets, writers, and attorneys are adept in linguistic intelligence.

Musical Intelligence is the ability to hear, recognize, remember, and manipulate musical patterns. The first intelligence to emerge, often in early childhood, it involves an innate understanding of pitch (or melody), rhythm, and timbre (the characteristic qualities of a tone) and an ability to appreciate the emotional aspects of music.

Traditional IQ tests primarily measure linguistic and logical/mathematical skills, whereas Gardner's theory of Multiple Intelligences proposes at least eight other skill areas. Gardner's research expands the idea of intelligence and asks: How does intelligence express itself? In what ways is a person smart?

Multiple Intelligence theory provides students with a variety of opportunities to explore, think, and make sense of what they learn; is problem-centered, offering a range of topics appealing to wide interests; allows teachers to engage students in problem solving and enables students to demonstrate understanding through performance assessment; encourages critical and

---

Logical-Mathematical Intelligence (nonverbal problem solving) is the capacity to move from the concrete to the abstract, to discern and make sense of patterns, symbols, and codes. This intelligence is the basis of the scientific, mathematical, and computer-oriented thinker.

Spatial Intelligence is used in navigation, map reading, and the arts. Also called visual-spatial, it is the capacity to perceive the visual world accurately, to transform and modify initial perceptions, and to re-create aspects of these perceptions. Spatial intelligence is evident in artistically oriented individuals, such as visual artists, sculptors, and architects. The scientifically oriented person draws on spatial intelligence to study anatomy, geography, or topology.

Bodily-Kinesthetic Intelligence (sports, drama, dance, and the use of tools) comprises the ability to use one's body in highly skilled ways for expressive and goal-directed purposes. It includes the capacity to work well with objects, whether they involve fine motor skills or whole body movements. Dancers, performers (especially mimes), athletes, and craftspeople are accomplished in this intelligence.

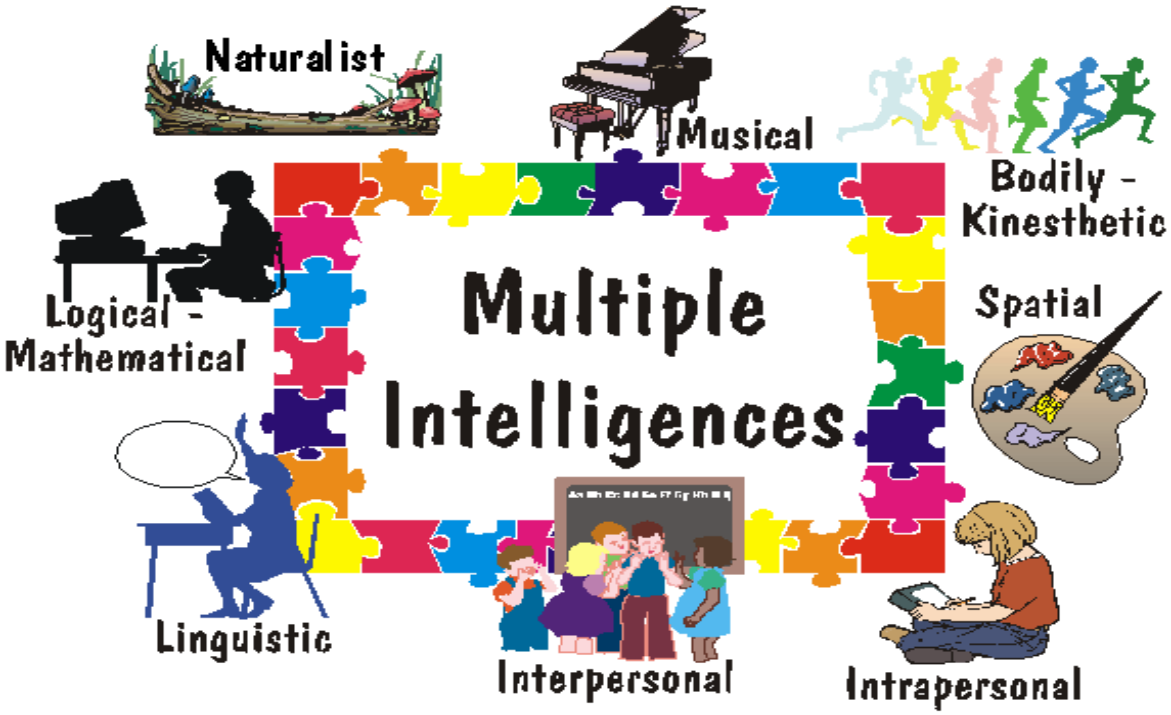
Interpersonal Intelligence (social and leadership skills) includes the ability to notice and make distinctions among other individuals, to read the intentions and desires of others, and to act on this social knowledge. This type of intelligence is important for political and religious leaders and is often well developed in skilled parents, teachers, and therapists.

Intrapersonal Intelligence (self-awareness) involves an understanding of one's own range of feelings and an ability to discriminate among them, label them, and draw upon them as a means of comprehending and guiding behavior. Novelists often tap into this intelligence, especially if they are also gifted in linguistic intelligence.

Naturalist Intelligence is the ability to discriminate among living things and features of the natural world. The last of Gardner's intelligences to be identified, it is characterized by an ability to recognize, distinguish, and categorize members of a species. Botanists and gardeners draw on this capacity.

creative thought; provides opportunities for practical application of knowledge and cultivates personal reflection.

In developing his theory, Gardner drew upon findings from 1. evolutionary biology; 2. anthropology; 3. developmental and cognitive psychology; 4. neuro-psychology; 5. psychometrics.



2. Theoretical framework

The training of university teachers is a subject widely debated upon and studied in the field of professional development. If we take reflection upon the academic profession in the past, it can be stated that nowadays, more than in any other age, the profession of university teacher is facing more challenges, and one of these is represented by the initial and continuous training of academics.

Training is complex and diverse phenomenon which, despite the various existing conceptualizations contributes to the analysis. Although there are other terms which may be deemed synonyms (preparation, practice, capability, education, instruction) the term of *training* has its own significance, being the most used.

Gardner used eight different criteria to judge whether a student candidate ability can be counted as an intelligence:

1. potential of isolation by brain damage; 2. existence of savants, prodigies; 3. an identifiable core operation or core operations 4. support from experimental psychological tasks 5. support from psychometric findings 6. a distinctive developmental history with a definable set of expert

end-state performances 7. evolutionary plausibility 8. susceptibility to encoding in a symbol system.

These include: solving problems well, reasoning clearly, thinking logically, using a good vocabulary, drawing on a large store of information, balancing information, sustaining a goal orientation, and showing intelligence in practical, not just academic way. People judged intelligent by our culture know a lot and think well with what they know. This puts them in a better position to learn more. (Goodrich, 70)

3. Music intelligence as the most popular one in the 3rd millennium

Gardner's work on nine new intelligences was the inspiration for many psychological studies on how people appraise and communicate emotions, and how they use these to solve problems.

Musical intelligence is the capacity to discern pitch, rhythm, timbre, and tone. This intelligence enables us to recognize, create, reproduce, and reflect on music, as demonstrated by composers, conductors, musicians, vocalist, and sensitive listeners. Interestingly, there is often an affective connection between music and the emotions; and mathematical and musical intelligences may share common thinking processes. Young adults with this kind of intelligence are usually singing or drumming to themselves. They are usually quite aware of sounds others may miss.

(Taken from: Overview of the Multiple Intelligences Theory. Association for Supervision and Curriculum Development and Thomas Armstrong.com)

The attitude that intelligence is one-dimensional has been an obsolete theory as of several decades ago, after Howard Gardner has released his multiple-intelligence model in 1983. With this model, he indicates the importance of many dimensions in the scope of human abilities, such as verbal-linguistic, logical-mathematical, musical-rhythmic, physical-kinesthetic, interpersonal and intrapersonal intelligences.

Verbal-linguistic intelligence and logical-mathematical intelligence are most often associated with academic achievement. Music-rhythmic intelligence, physical-kinesthetic and visual-spatial intelligence are more active in artistic domains, while interpersonal and intrapersonal intelligence are important for understanding social relationships.

Impelling and developing talent and creativity with all learners, thanks to Gardner's theory, open up new horizons in thinking and acting in reality.

Musical intelligence points to the existence of the capacity to deal with music, in terms of composing, performing and experiencing musical content. The theory of multiple-intelligences has in itself the thesis that talent is expressed as a potential that can be unused

(idle) so it can be mistakenly thought that the person in whom that potential is not used, is actually not gifted.

The synthesis of terms used to indicate musical behavior was made by Roland Person. He believes that terms can be clarified by categories of genotype (genetically determined potential) and phenotype (developed behavior that results from a particular genotype). Those terms that can't be explained by these two categories, he classifies in the category of universal terms (used daily and often).

Some researchers give only heritable feature to music potential so it can be identified before the start of music tuition training. Through this they explain the existence of differences in the achievements of individuals who develop in approximate equal environmental conditions, but whose genetic potentials for dealing with music are differently developed. On the other hand, there is an opinion that for achieving high results a little talent is required, but with much more work.

The third concludes that talent is the result of the interaction of genetic capacities and environmental factors so at the same time it is innate and acquired. A scientific research has ascertained that there is also a third factor, as well as that neither is solely sufficient for some of the potentials to be used successfully. The third factor is the activity of an individual- the only way that the inherited potential and acquired knowledge could be exploited is the activity of an individual.

The concept of emotional intelligence emerged as part of Gardner's view of social intelligence, the first of its kind to suggest that there are several types of intelligence, including ***interpersonal intelligence***, the ability to understand other people, and ***intrapersonal intelligence***, the ability to understand yourself and develop a sense of your own identity (Gardner).

Interpersonal intelligence is the ability to understand and interact effectively with others. It involves effective verbal and nonverbal communication, the ability to note distinctions among others, sensitivity to the moods and temperaments of others, and the ability to entertain multiple perspectives. Teachers, social workers, actors, and politicians all exhibit interpersonal intelligence. Young adults with this kind of intelligence are leaders among their peers, are good at communicating, and seem to understand others' feelings and motives.

Intra-personal intelligence is the capacity to understand oneself and one's thoughts and feelings, and to use such knowledge in planning and directioning one's life. Intra-personal intelligence involves not only an appreciation of the self, but also of the human condition. It

is evident in psychologist, spiritual leaders, and philosophers. These young adults may be shy. They are very aware of their own feelings and are self-motivated.
(Taken from: Overview of the Multiple Intelligences Theory. Association for Supervision and Curriculum Development and Thomas Armstrong.com)

The theory of multiple intelligences is so intriguing because it expands our horizon of available teaching/learning tools beyond the conventional linguistic and logical methods used in most institutions. To get started, put the topic of whatever you're interested in teaching or learning about in the center of a blank sheet of paper, and draw eight straight lines or "spokes" radiating out from this topic. Label each line with a different intelligence. Then start brainstorming ideas for teaching or learning that topic and write down ideas next to each intelligence (this is a spatial-linguistic approach of brainstorming; you might want to do this in other ways as well, using a tape-recorder, having a group brainstorming session. (www.institute4learning.com)

Reasoning behind Gardner's theory: 1) Individuals should be encouraged to use their preferred intelligences in learning; 2) Instructional activities should appeal to different forms of intelligence; 3) Assessment of learning should measure multiple forms of intelligence. (Gardner)

4. **Role and importance of teachers**

Schoolmasters, teachers and other preceptors (in the following two teachers) from the sphere of education represent the most important components of quality education for children and youth. The teacher is thought of as a member of an organization which is dealing with teaching and upbringing, the initiator of change, the actuator of learning and someone who is oriented towards personal professional development.

In addition, it is desirable for teacher to be careful and attentive in working with children, to have developed emotional intelligence and to develop that intelligence within his pupils.
It is very important that a teacher has the ability to recognize undetected abilities in every child and to remove any pupil's doubts about themselves. The quality of pupil's experience in school significantly contributes to the teacher's priorities, his sensitivity and moral principles- if the teacher does not have a developed love for the call of enlightenment and the sense of moral responsibility towards his student then he must change his profession because he does not contribute to the development of society but impairs it.

5. **Teachers' professional lifelong learning**

Learning is a way of interacting with the world. As we learn, our conceptions of phenomena change, and we see the world differently. The acquisition of information itself does not bring

about such a change, but the way we structure that information and think with it does…Education is about *conceptual change*, not just the acquisition of information. (Biggs, 2003)

The *concept of continuing professional development* is the permanent development of a person as a personality and a professional, and it is connected to the psychology of teaching and foreign language acquirement. *Education, references and specialization* are three items, together with experience and practice, that constitute continuing professional and long-term, almost life-long teacher development.

In the last two decades the educational process and its development have globally been innovated and in front of education are high requirements, where for different school levels new competences are needed and also new demands are put before teachers of the new millennium in the new social context in which the educational process is being carried out.

The new competences and multiple demands which are required from teachers are a constituent part of the European and national documents agreed by educational policies.
In order to respond to these time challenges, systemic solutions, academic knowledge and pedagogical skills are needed, necessary for the useful, effective and qualitative work of a teacher.[1]
A new strategic framework of European cooperation is the Education and Training 2020 (ET 2020) in education and training, corresponding to the challenges of lifelong learning that are a reality for all educational factors. The quality of such work is in considering one's own potentials (formal and informal), economic prosperity and the employment rate.

The conclusions of this document are considered in four directions:

1. *Making lifelong learning and mobility a reality* – progress is needed in the implementation of lifelong learning strategies, the development of national qualification frameworks linked to the European Qualifications Framework (EQF) and also expanded and applied to European Qualifications Framework.
2. *Improving the quality and efficiency of education and training* – all citizens need to be able to acquire key competences and levels of education and training and make them attractive and efficient.
3. *Promoting equity, social cohesion and active citizenship* – education and training should enable all citizens to acquire and develop skills and competencies needed for

[1] AT, BE-fr, CZ, IE, LV, RO, UK

their employability and foster further learning, active citizenship and intercultural dialogue. Educational disadvantage should be addressed through high quality inclusive and early education.

4. *Enhancing creativity and innovation, including entrepreneurship, at all levels of education and training* – the acquisition of transversal competences by all citizens should be promoted and the functioning of the education–research–practical skills knowledge triangle; the development of attitudes such as motivation, value orientations, emotions (Rychen & Salganik). Recently, international scholarly consensus converged on the definition of competences –also defined as capacities – as basic requirements for teaching, articulated in knowledge, craft skills and dispositions (Feiman-Nemser, 2001; Grant, 2008; Williamson McDiarmid and Clevenger-Bright, 2008). Such a definition focuses on the potentialities of continuous development and achievement, associated with aims and objectives in a lifelong learning perspective, and it specifies requirements in the knowledge area: subject matter knowledge; pedagogical subject knowledge; pedagogical knowledge; knowledge concerning curricular materials, recurrent difficulties of subject-specific learning; learning context and objectives; educational sciences foundations (intercultural, historical, philosophical, psychological, sociological knowledge); contextual, institutional, organizational aspects of educational policies; issues of inclusion and diversity, new technologies; developmental psychology, group processes and dynamics, learning theories, motivational issues; evaluation and assessment processes and methods.

Craft skills consist in the following: planning, managing and coordinating teaching; using teaching materials and technologies, managing students and groups; monitoring and assessing learning; collaborating with colleagues, parents and social services.

The lifelong training of the teachers didn't used to be as important issue as it is today. The era of the internet, rapid flow of the easily accessible information, i.e. the technology is developing rapidly and the educational system continually stays behind. Some of the growing problems are: How to make the students interested in class? How to maintain the order and the discipline? How to become an important figure in the life of the students, a figure they appreciate and respect? And so on. So, a teacher must work on self-improvement, attend as many educational seminars as he can, upgrade his official education. He should exchange his knowledge, ideas and experiences on a regular basis with his colleges, from his region but worldwide as well. Professional training of a teacher begins when he first sets foot in a

classroom. The knowledge he acquired during his education are then applied to practice that base is then broadened and deepened due to the interaction with his students. The training also takes place in the domains of methodology, didactics, pedagogy and psychology, neither of these domains must be neglected. But, not everything is down to the teachers and students, although they are the two most important factors when we talk about successful education.

The Ministry of education and adequate boards have different responsibility, which will not be discusses in details, but that is very important for the development of the education and the society.

A teacher, in order to be motivated for further progress, alongside his personal motivation, must often have financial support for further training. If the financial factor is not secured, the possibilities of teachers for progress are reduced, often impossible. The training can be carried out in several ways: Through seminars, counsels, lectures, courses, workshops, camps etc. Taking time to write scientific, professional and investigational papers is encouraged, as well as being open for corrections of work if necessary. A teaches that perceives this further training as a motivation, rather than solely as a imposed obligation, is capable of developing the objectivity and analytics of the occurrences and processes that happen inside and outside this training. That type of person want to be more advanced, more just, more competent, more successful, more respected- a teacher that possesses these characteristics is very likely to be very successful and productive working with his students as well as respected by his colleagues and society. But, it does not depend solely on the teacher whether the idea of this continuous training will be realized or not- it also depends on the school and all the institutions that take part in organizing the teaching curriculums and their compulsory and facultative activities.

The primary roles of the teachers are the education and the tutoring of the students in order to acquire knowledge. However, maybe it is more important to teach the students how to be independent, how to gain knowledge on their own, to be persistent, to develop their self-confidence, as well as the empathy towards others. A teacher has a very responsible role to play, therefore he must be as trained as possible, as well as experienced in transmitting knowledge and education in the right way to their students. He must know his students well, and it also desirable for him to be able to spot changes and mood swings that could occur to his students, as well as psychosomatic manifestations. Human psyche is still to be researched, so what we know about changes on daily bases, and a good teacher is the one who will try to keep up with the new findings in the fields of psychology, pedagogy and methodology. In order

for a student to be able to manage his own abilities, his creative thinking should be developed, and that creative thinking must be divergent and convergent. But, the main condition for all that to be possible is that the teacher also possesses the ability of creative thinking.

Divergent thinking is the ability of turning one idea into various. It represents creative finding of multiple solutions for a single problem. On the contrary, convergent thinking means finds just one solution for a specific problem. We use convergent thinking when we make prudential decisions after a process of evaluating different ideas, information and options. In the creative work we need both lines of thinking: first we use the divergent thinking, and then the convergent one, i.e. first we come up with multiple ideas, and then, with selective approach, it all comes down to a particular solution. It means that creativity cannot be simply brought down to the first creative impulse, it is also necessary to investigate both divergent and convergent ways of thinking in order to find the optimal solution for the problem.

Furthermore, creative thinking involves both originality and flexibility. And ability to produce ideas and answers which are rare, unusual or humorous means to have developed the originality of thinking. Flexibility reflects in being able to change the way of thinking while solving the problem, also in the ability to consider different points of view and perspectives, and in having the tolerance for the vagueness (for the unclear and ambiguous situations).
Open minded people are more capable of incorporating new cognitions and convictions into their, already existing, system of knowledge i.e. broaden it, improve and upgrade it. On the other side, if the teacher or the student are close minded then it involves high level of rejecting believes that are contrary to the ones they already have and being interested only in the information that supports their current way of thinking. For the close minded people it is also characteristic to be dependent on order, system and control. More close minded people are, more likely is that their opinion is based on unreliable sources, the opinions of the majority, tabloids, and speculations, with no critical analyzing and without checking the given information. In order for man to be creative, he should observe the world in an open and critical manner.

The open mindedness is not the same as having affinity for newest achievements. But the ability to integrate the old and the new experiences into a new, better state. The undesirable extreme is the kind of openness that is always prepared to easily change its postures, beliefs and behaviors.

This training is a process, lifelong orientation, and the people who strive for it, normally, are prone to the criticism of their own, as well as other people's knowledge, and their

competence. That kind of attitude should be brought to a higher level, from one teacher to the entire social and cultural system in which we exist. It is a condition for human development, for the well-being of the whole mankind. It is not easy at all, but we need to be aware that we all play a role and have a duty in building quality environment.

6. Concluding Remarks

This paper proposes several ways of approaching knowledge sharing in the context of intelligences and teachers' development in university education system.

The role of the teacher and a pedagogical approach to teaching is the key to quality of education, but it is not a unilateral process. Such a role explains the quality of learning through new European recommendations about teachers' professional development.

Gardner presents a radically different view of the mind, recognising different and discrete facets of cognition, acknowledging that people have different cognitive strengths and contrasting cognitive styles. The idea that intelligence is fixed, that the brain changes its architecture only in early life, and that all brain damage is permanent, belongs to the past. Evidence abounds that throughout life, the human brain restructures itself according to what it learns. The concept of plasticity offers hope to educators, who impart the importance of lifelong learning to students. Notions about intelligence vary over time, across cultures and even within cultures. Definitions of intelligence depend on whom you ask, their methods and levels of study, and their values and beliefs. Definitions are associated with the needs and purposes of different cultures.

Thinking about intellect and intelligence has been influenced in recent decades by 1. new technologies such as the computer; 2. brain research (aided by technologies such as MRI scanners etc); 3. studies about the use of the mind in different cultures and contexts (anthropology); 4. interpretation and re-interpretation of research findings about knowing and learning.

In the past few decades, the traditional view of Intelligence has been challenged by a number of researchers, including Howard Gardner. His theory of Multiple Intelligences challenges the traditional *dipstick* view of intelligence as a unitary and fixed capacity that can be adequately measured by IQ tests.

Knowledge sharing research involves theories of several disciplines such as management, psychology, philosophy and sociology. It is very difficult to formulate clearly the effective ways to realize university teachers' knowledge sharing.

General pedagogical knowledge implies knowledge of the medium of learning and instructional strategies for a combined (theoretical and practical-based) teaching and the knowledge of the learner the obstacles of university teachers' knowledge sharing can be summarily considered as following: 1. *cultural obstacles in knowledge sharing of university teachers*. Cultural barriers of knowledge sharing often manifested the lack of correct understanding on knowledge sharing, inoperative positive value concept and the choice of sharing behavior. Restriction of cultural environment is the biggest obstacle of knowledge sharing, such as the lack of mutual trust and equal exchange, not to encourage innovation etc. Due to the busy teaching work and heavy scientific research task, there is very little time to communication and exchange between teachers. The characteristic of teacher's job is relatively independent, and many outstanding teachers tend to stick to their own barony of business and academic instead of cooperation and interaction with others, which is the waste of resources. The source of this bad sharing atmosphere lies in interest conflict and knowledge difference. On the one hand, the enormous function of knowledge sharing is to improve overall organizational knowledge level by sharing individual knowledge with other members in organization. People are often willing to do what's best for themselves, not to their own interests at the expense of compromise and sacrifice. On the other hand, the differences such as knowledge structure, knowledge understanding, thinking model, cognizing style and values between teachers result in the difficult to form a mutual benefit not only to accepter but also giver. When the transfer of knowledge is only one-way, the knowledge owners would not be willing to transfer their knowledge, can only be a lecture type preaching, and can't form a shared environment; 2 *institutional obstacles in knowledge sharing of university teachers* The existing organizational structure of most universities is the pyramid-like level management model. In this mode, there are so many layers of management, which without question will affect the speed of information transfer. In this organizational structure, teachers often only work in specific smaller narrower range for the particularity and professionalism of the teaching and research. Therefore the faculty and staff often make their tasks and responsibilities one-sided while ignoring the organization's objectives and responsibilities from the perspective of the universities. There are hierarchical gaps among staffs or departments in internal communication due to level management. The level management and work difference hinder direct contact and exchange. Channels for knowledge sharing is not smooth inevitably affect the realization of the knowledge-sharing. At the same time, the institutional and systemic adverse factors, resulting in the lack of enthusiasm of the faculty and staff to knowledge-

sharing. The linear organizational structure of universities has also hindered the implementation of knowledge sharing; 3. *technological obstacles in knowledge sharing of university teachers* Although the cultural environment is crucial factor for knowledge sharing of university teachers, the support of information technology is essential. If lacking necessary technical support, knowledge sharing will be difficult to play its due effect, eventually become a mere formality and to be empty. Role and motivation of technology as a pillar in knowledge management process presents an encouraging picture for organizations vying knowledge sharing. Modern information and telecommunication technology is available to support knowledge sharing across time and distance barriers improving access to information about knowledge. However, universities investing in this type of technology often face difficulties in encouraging their teachers to use the systems to share their ideas.

References

1. Biggs, J.B. (2003) Teaching for quality learning at university. Buckingham: Open University Press/Society for Research into Higher Education. (Second edition)

2. Gardner, Howard (2011) Frames of Mind: The Theory of Multiple Intelligences. New York: Basic Books.

3. Gardner, Howard (2006) Multiple Intelligences: New Horizons in Theory and Practice. New York: Basic Books.

4. Gardner, Howard (2000) Intelligence Reframed: Multiple Intelligences for the 21st Century. New York: Basic Books.

5. Hendriks P. (1999) “Research Article: Why Share Knowledge? The Influence of ICT on the Motivation for Knowledge Sharing”, Knowledge and Process Management, Volume 6 Number 2.

6. Educational Leadership Nov. 2001

Overview of the Multiple Intelligences Theory. Association for Supervision and Curriculum Development and Thomas Armstrong.com, accessed on April 2018.

7. Goodrich & Perkins, 1998, *Chap.4 Learnable Intelligence*

Hyland, 2000, *Final Report on MI Curriculum and Assessment Project*, UCC.

8. Common European Principles for Teacher Competences and Qualifications (EC, 2010).

9. European Commission, Education and Training 2010 (EC, 2009).AT, BE-fr, CZ, IE, LV, RO, UK

10. Quality Assurance in Teacher Education in Europe (EC, 2006).

11. www.unesco.org/iiep

12. www.institute4learning.com