Impact of Leadership Competencies Program for Nurses on Their Innovation through Schoology Platform: Visual Learning Style versus Verbal Learning Style

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Abstract

The health field in our time is characterized by changes, crises, pandemics, and conflicts. These require a competent nurse leader capable of innovation for managing those challenges. Knowing the effective learning style for nurses is very crucial for achieving the desirable result regarding their continuing education. Purpose: This study aimed to evaluate the impact of leadership competencies program for nurses on their innovation through Schoology platform by using two types of learning styles visual and verbal learning style and compare between them. Methods: Quasi-Experimental pre-test and post-test design was conducted using two groups. A convenience sample (N = 60) of nurse who enrolled in postgraduate studies and accept to participate in the study. Three instruments were applied which are index of learning styles survey to divide the sample in to tow group (visual/verbal learning style), leadership competencies knowledge test, and innovation scale. Results: The study result revealed that the mean of leadership competencies knowledge and innovation was improved at post program for both tow groups. Furthermore, there was a highly significant difference between the two groups regarding post program results. Also, the visual learning style is more effective than verbal learning style. Thus, from these results the program is succeeded in achieving its objectives. Recommendation: Based on the findings, the concept of leadership competencies as well as innovation should be included in training program and post graduate curriculum for nurses. Also, knowing the preferred learning style of the learner is important. Lastly, periodic updates and training on the visual learning style for teaching staff.

Introduction

With the emergence of COVID-19 pandemic it is found that COVID-19 prevention and treatment activities are mainly focused on nurses. Clearly, nurses should insure that patients receive specialized high-quality care. In the same line, it is anticipated increased workload on nursing and the health system as a result of COVID-19. Thus, nurses need to assess needs, create and implement innovative approaches to manage these challenges. In all fields of nursing, innovation and innovative practices are highly important (Doğan, 2021). Understanding, developing, implementing the innovation process, and creative practices will improve patient care and enhance quality of life. It has a great effect on the national economy and organizations development (Yıldız et al., 2019). Therefore, many organizations are looking for strategies that foster and support employee innovation. One of these is leadership that can encourage employees to be more innovative (Kozioł, 2020). Thus, nursing administrators and planners should adapt the current curriculum to include leadership competencies training and also, in the era of post-graduation in continuing education (Hozni et al., 2019). Competent leadership is a key aspect of the job management with positive effects for nurses, patients, and their families, as well as the institution as a whole (Zaghini, et al., 2020). Clearly, educators should be familiar of the preferred learning styles of their students. This could benefit in the advancement of nurse education science as well as the development and implementation of a scientific proof culture (Homood et al., 2017). Based on leadership competencies advancements, nurses should be well prepared for their leadership roles. As a result, identifying leadership competencies and critical aspects on a global basis is required (Heinen et al., 2019). In a healthcare organization, effective nurse leadership is linked to employee morale, retention, turnover, and care quality. Nursing leadership growth requires a sufficient level of educational preparation as well as a set of abilities and skills (Lee et al ,2019). Leadership in nursing is viewed as a difficult process which includes providing direction and support, motivating, coordinating, collaboration, effective communication, and advocating for patients to achieve optimal outcomes (James, 2010). Critical thought, action, and advocacy are all important aspects of nursing leadership. Mentoring, coaching, supporting, rewarding, and attracting other leaders at all levels are all part of it (CNA, 2009). American Nurses Association ANA (2013) stated that leadership competencies is the intended and defined outcomes of learning and that leadership and leadership competencies are not restricted to one single theory. A competency can be defined as 'an expected level of performance that results from an integration of knowledge, skills, abilities and judgment , while domain is the area of personal and professional knowledge or responsibility. The competencies nursing leadership model might be used to construct and validate leadership training, teaching, and evaluations in both academic and clinical contexts (Meeks , 2018). Leadership competencies include clinical leadership domain, professional leadership domain, health systems leadership domain, clinical and health systems leadership domain, professional and health systems leadership, health systems and health policy leadership (Heinen et al., 2019). In another view American Nursing Association stated that the three stages of the leadership competency framework are: leading you, leading others, and leading the organization. Moreover, Communication, conflict, innovation, diversity, employee development, relationships, business acumen, change, decision making, problem solving, project management, influence, systems thinking, and vision and strategy are among the individual nurse leader competencies (ANA, 2013). A competency model of leadership referred to the system of key competencies formulated on the basis of a study of key indicators of effective leadership behavior (Stare & Seljak, 2013). It is believed that nursing leadership and management encourage innovative behavior. Therefore, the innovative behavior is an important concept to be considered in nursing for improving the quality of nursing care and increasing positive outcomes for the health-care organization. Thus, the creation of instruments and the conduct of empirical studies on innovative in nursing research and practice should be the focus of future research (Asurakkody & Shin, 2018). The process of innovations has been first introduced by Schumpeter in 1934 in the field of economic sociology (Schumpeter, 1934). Innovation in health is defined as the ability to use executive talents to strategically redesign health services in order to create an integrated health system that is responsive to change and compatible with core values (Meyer, 2011). Moreover, Weberg (2009) defined healthcare innovation as "anything new or perceived new by the population experiencing the innovation, with the potential to drive change and redefine healthcare's economic and social potential. Clearly, the terms in this area including innovation, innovativeness, innovative behavior, and innovative work behavior are used interchangeably or

as the personal preference because of the lack of clear definitions of innovation in different fields including health care (Ali ,2018).Specifically, innovation composed of eight dimensions including opportunity exploration, idea generation, idea search, idea communication, idea promotion, championing, application, and overcoming obstacles (Asurakkody & Shin, 2018). Nurses are a profession that requires lifelong learning due to the nature of their work as well as legal regulations (Kvas et al., 2014). It is recommended that translation these leadership competencies and aligned to curricula and clinical learning programs; and evaluating the effect of leadership competencies on nurse sensitive outcomes (Heinen et al., 2019). Due to the closure caused by the Corona virus, universities and schools have resorted to e-learning. E-learning is a method of distance learning and education using the internet, smartphones and learning platforms. Three major e-learning platforms have been and are still being used for learning (Google Classroom, Edmodo, and Schoology). Schoology is one of the best Learning Management Systems. Schoology is an e-learning platform and social learning network for online teaching and learning. It makes a huge difference in terms of boosting access to curriculum and extra materials (Abbas, 2020). Schoology has the following features, according to Low (2017) like course, group discussion, resources, quiz, attendance, and analytics. Manning et al. (2011) illustrate that Schoology is a free and secure social and learning platform. Its design is similar to that of Facebook in which there are conversations, messages, comments. In Schoology, information and other media such as photos and videos can be shared. Moreover, Al-Enezi (2021) stated that training program based on interactive e-learning platforms had a great role on developing the skills. Clearly, learning style preferences exist among nurses. The need for education in various formats is essential to the success of nurses in the development health care environment. Knowledge of preferred styles of learning of the organization's nursing staff can help the planning delivery, resource utilization, and evaluation of learning activities (Mangold et al., 2018). Identifying learning requirements is necessary for developing nursing professional activities that address educational gaps and lead to quality patient care and positive patient outcomes. Resources for professional development can be limited and may compete with nurses' other priorities for time, effort, and financial allocation. Thus, keeping in view that learning style preference of the learners is essential for guiding nursing education in developing effective education plans (McCrow et al., 2014). Learning styles are viewed as "habitual cognitive and affective behaviors which identify how each human engages in learning culture" (Andreou et al., 2014). Furthermore, when it comes to learning styles, it's common to assume that some are more successful than others. The selection of learning instructions, learning appreciation, and time completion were all influenced by the cognitive types of the learners as verbal or visual style. As a result, learners with a certain learning style are more inclined to choose learning instructions that are similar to their learning style (Alhathli et al., 2018). Homood et al. (2017) reported that Felder and Silverman had presented four categories of learning preferences as follows: input (visual/verbal), perception (sensing/intuitive), processing (active/reflective), and understanding (sequential/global). The verbalizer-visualizer style is a significant aspect of learning style (R.J. Riding, 2001). Pictures, graphs, flow charts, time lines, films, and demonstrations help visual learners to recall what they see. They find diagrams, sketches, schematics, pictures, flow charts, or any other visual depiction of predominantly verbal course material to be extremely helpful in learning. They list crucial points on idea maps. On the other hand, written and spoken explanations are more effective for verbal learners. They create their own summaries or outlines of course material, work in groups for a more effective learning experience, gain comprehension of subject by listening to peers' explanations, and learn even more when they are the one doing the explaining (Felder & Solomon, 2007) In the same line, in the visual learning style learners remember information effectively when visual aids are used, such as, pictures, images, film clips, colors and diagrams. They're also adept at interpreting evidence supplied visually in maps, charts, and graphs. Oppositely, in verbal style the learners like to use words and linguistic abilities - such as reading, writing, listening, and speaking - in speech and writing. They appreciate word games, puns, and rhymes, and they are frequently good public speakers (Somji, 2018).

Justification of the Study

This age is characterizes by crisis, challenges, pandemics, new diseases, and shortage resources in health discipline. Thus, it need professional competent nurse leader who able to innovate new solutions to manage these situations. Moreover, Yıldız et al. (2019) asserted that professional health

discipline should develop innovative thinking skills in order to keep up with the rapidly changing and developing science in nursing, to manage global competition well, and to benefit from innovative methods especially in health care practices. At the same line Hill et al. (2014) highlighted the effective role of leadership in driving innovation. Thus, Nurses should contribute to leadership development by attendance of formal education programs, workshops, distance learning, and e-learning (Hassan et al., 2020). E-Learning has emerged as a practical solution for nursing continuing education in the hospital setting (Dalhem ,2014).It is reported that taking into account learning styles can success the learning process and outcomes Knowing how to learn effectively will help these education programs be more effective, and learners will be better equipped with these skills (Alhathli et al., 2018). In Egypt, learning based on competencies in nursing begins recently in undergraduate curriculum and not included in post graduated nurses or nursing continuing education. In addition there is lack of study about the role of leadership competencies programs on nurses' innovation, and the effective learning style of nurses in these programs. So, the purpose of this research is to evaluate the impact of leadership competencies program for nurses on their innovation through Schoology platform by using two learning styles (visual learning style versus verbal learning style). This purpose should be fulfilled through the following objectives:

1: Assess the preferred learning style for nurses (visual learning style nurses' group and verbal learning nurses' group) at preprogram.
2: Assess knowledge test score of leadership competencies and innovation for visual learning style nurses' group and verbal learning style nurses' group at preprogram.
 3: Develop leadership competencies program for nurses through Schoology platform by using two learning styles (visual learning style and verbal learning style).
3: Evaluate effectiveness of leadership competencies program on innovation for both visual learning style nurses' group and verbal learning style nurses' group.
4: Compare between visual learning style nurses' group and verbal learning style nurses' group regarding the results post program.

Research Hypothesis

The current study is carried out to investigate the following hypotheses:-
H (1): There will be difference in knowledge test score of nurses' leadership competencies after the program implementation compared to before for both visual learning style nurses' group and verbal learning style nurses' group.
H (2): There will be difference in scores of nurses' innovation after the program implementation compared to before for both tow groups.
H (3): There will be difference between visual learning style nurses' group and verbal learning style nurses' group regarding mean score of leadership competencies knowledge and innovation after the program implementation.

Conceptual Framework

Phillips et al. (2010) developed the learning environment, learning processes and learning outcomes (LEPO) model which is informed by a range of work in higher education and educational technology research. The LEPO framework conceptualizes learning as having three components: the environment which facilitates learning (Learning Environment), the activities which are part of learning (Learning Processes) and the knowledge, behaviors, skills or understanding which can be demonstrated (Learning Outcomes).

Methods

Study Design

Quasi experimental research design pre-test and post-test design was used to achieve the purpose of present study using two groups; visual learning style group and verbal learning style group of nurses.

Sample

A convenience sample of all nurses who enrolled in postgraduate studies master and doctorate degree of the academic year 2020-2021 first semester at Menoufia University, Faculty of Nursing and accept to participate in the study. The number was 60 nurses. The sample was divided into visual learning style group and verbal learning style group by using the index of learning styles survey and each group include 30 nurses.

Instruments

The study questionnaires were composed of three instruments.

The First Instrument (The Index of Learning Styles Survey)

Researchers used The Index of Learning Styles survey by (Felder & Solomon, 2006). The survey contains questions related to four domains –Active/Reflective, Sensitive/Intuitive, Sequential/Global and Visual/Verbal. However, for this study only the Visual/Verbal scores were taken into consideration to examine the visual and verbal learning styles of the nurses. The paper pencil learning styles Survey consisted of 44 questions with forced-choice items with two options (a and b).The participants select the appropriate answer for each question.

The Second Instrument (Leadership Competencies Knowledge Test)

The questionnaire used in this study was developed and constructed by the researchers to determine the level of nurse's knowledge related to leadership competencies after reviewing the related literature. It was consisted of two parts:

Part1 included demographic characteristics of studied nurses including age, gender, place of residence, and type of Post graduate program.
Part2, included questionnaire related to leadership competencies knowledge. It was conducted in the form of multi-choice and true and false questions. The total number of the questions was 20 items. Each question was granted one point for the correct answer, and zero for the wrong answer and didn't know. The total score for all questions was twenty. If the score was 60% or more it was considered good and poor if the score was less than 60% as designed by statistical analyst.

The second Instrument Innovation scale

The scale used in this study was developed by Lukes and Stephan (2017) building from a review of existing employee innovative behavior scales and theoretical considerations. It is used to determine the level of nursing innovation which consists of 23 innovation items. The scale was answered by nurses using a 3-point Likert scale which ranged from 1 (disagree) to 3 (agree).

Validity of Instrument

The validity of the tools was done by five experts (one professor and two assist Professors in nursing administration and two assist Professors in community health nursing) who interviewed the instruments for content accuracy and internal validity. Also, professors were asked to judge the items for completeness and clarity (content validity). Suggestions were incorporated into the instrument.

Reliability of Instrument

Reliability of the tools was estimated among six nurses by using test retest method with two weeks apart between them. Then Cronbach alpha reliability test was done through SPSS computer package. The index of learning styles survey was 0.76, leadership competencies knowledge test was 0.85, and innovative behavior inventory was 0.88. The results indicate that the three tools were reliable to detect the objectives of the study.

Pilot study

A pilot study was performed on six nurses in the study sample as three nurses from each group to examine the practicability and applicability of the study instruments. This sample was excluded from the study. The results of pilot study were incorporated into the study instruments.

Leadership Competencies Program

Implementing a leadership competencies program through Schoology Platform for nurses by using Visual and Verbal learning style passed through four phases:-

Assessment Phase

This phase aimed to assess nurses' preferred learning style (visual-verbal), leadership competencies knowledge, and innovation scale before program. Nurses asked to login to Schoology Platform by Clicking on the following link to access the website https://www.schoology.com/ as shown in picture (1) and create an account as a student: by clicking on the registration icon. Nurses asked to complete research Instruments via platform website which are (Learning style, Leadership competencies test, The innovation Scale).

Planning Phase

Based on the results of nurses 'learning style, leadership competencies knowledge and innovation the program was developed. The contents of the leadership competencies included the following sessions:

- The leadership and leadership competencies related concept.
- The effect of leadership competencies on nurse, patient, and hospital.
- ANA Leadership Competencies for Nurse Leaders.
- Six Key Nursing Leadership Competencies.
- Effective communication skills required to leadership competencies.
- Leadership Core competencies within (four) leadership domains.
- Leadership competencies and Innovation in nursing

picture1: The program contents was presented for two types of learning style group of nurses as
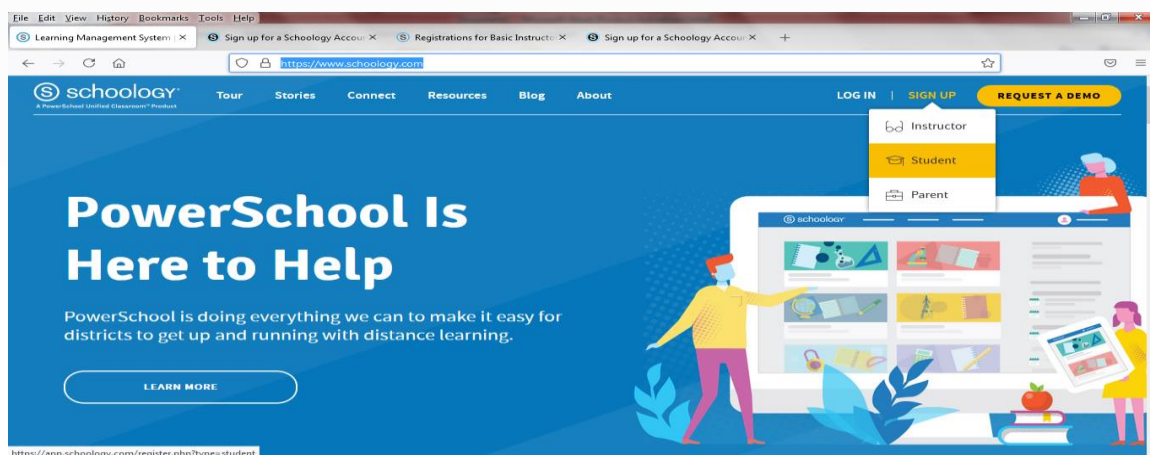
The visual learning style group

The program contents presented by visual aids such as, pictures, images, film clips, colors and diagrams. The learner adept at interpreting evidence supplied visually in maps, charts, and graphs.

The Verbal Learning Style

The program contents presented through reading, writing, listening, and speaking - in speech and writing. As the learners like to use words and linguistic abilities - They appreciate word games, puns, and rhymes, and they are frequently good public speakers. For presentation of the program contents according to tow learning styles, the researchers used various Soft Programs like:-

- Using different programs like Adobe Photoshop Cs5
- MS Word 2010 for format the text.
- Singate 9 for record videos
- Microsoft Word For witing text

Implementation Phase

There were two programs for nurses as verbal learning style group and visual learning style group. Nurses were informed to login again to Schoology Platform using the code that is specific for each program visual or verbal learning style .The researchers developed education video about the instructions regarding the program. Nurses were informed to watch this video and uses different icons that developed on website like contents presentation , videos, records ,Communication, comments, program activities and program Instruments. Learning and education process regarding program is interactive process between nurses and researchers. As shown in the picture 2,3 and the other pictures was in the appendix1.

Evaluation Phase

This phase aimed to assess nurses' leadership competencies knowledge and innovation post program through completing the program instruments on the platform.

Data Collection and Ethical Considerations

An official approval was obtained from the Faculty of Nursing. The purpose of the study was explained to each student and oral informed consent to participate in the study was gained from them. Privacy and other research ethical rights of participants were ensured. Voluntary participation in the study was assured to all participants as well. The data was collected during the first semester of the academic year 2020/2021.
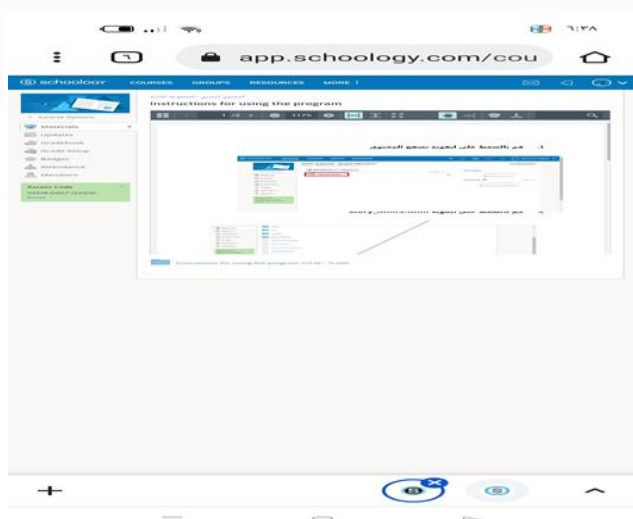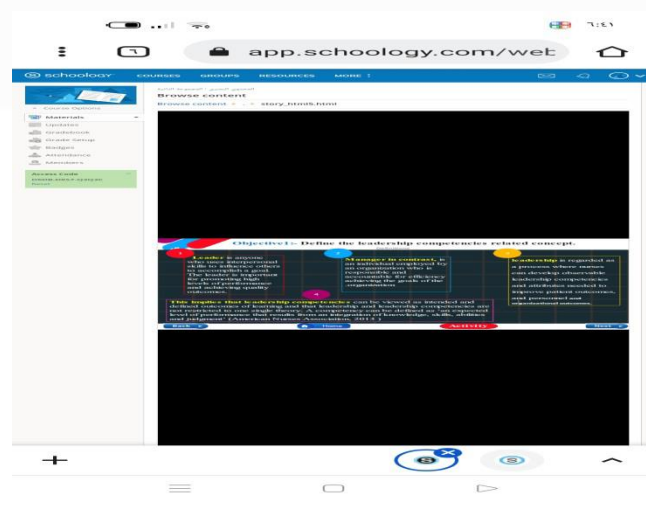
Picture2	Picture3

Data Analysis

Data were reviewed, coded, entered, analyzed and tabulated using Statistical Package of Social

Sciences (SPSS) version 25. Descriptive statistics (frequency, percentage, mean and standard deviation) were used appropriately according to the type of variables. Data was analyzed using paired sample T test for comparison between two means and level of significance was set as P value at p≤ 0.001.

Results

Table (1):
Distribution of the studied nurses according to their Socio -demographic characteristics and studied groups (N = 60)

Socio -demographic characteristics		Verbal group		Visual group		Test of Sig.	P value
		NO.	%	NO.	%		
Age (Y) Mean ± SD		34.9 ± 3.7 Y		34.5 ±3.8 Y		t=0.41	0.68 NS
Gender	Female	29	96.7	29	96.7	X^2 =0.0	P=1.0 NS
	Male	1	3.3	1	3.3		
Residence	Rural	23	76.7	18	60	X^2 =1.9	P=0.16 NS
	Urban	7	23.3	12	40		
Program	Mas Master	27	90	27	90	X^2 =0.0	P =1.0 NS
	Doctorate	3	10	3	10		
Experience	Mean ± SD (Y)	10.6 ±3.5		10.2 ±3.4		t= 0.41	P=0.68 NS
Total		30	100	30	100		

Table (1) showed the Distribution of the studied nurses   according to their Socio -demographic characteristics and studied groups. As noticed in the table, the mean age of verbal and visual groups of nurses was nearly similar (34.9 ± 3.7 & 34.5 ±3.8) years respectively, and the difference was not significant statistically (P=0.68). Similar trend was observed concerning mean years of experience (10.6 ±3.5 & 10.2 ±3.4) years respectively, and the difference was not significant statistically (P=0.68). Majority of studied nurses were females, residence in rural areas, and had Master degree. There were no significant difference between visual and verbal groups regarding each item of socio-demographic characters (P>0.05 for each).

Table 2:
The effect of leadership competencies program on leadership competencies knowledge for both the Visual and Verbal learning style nurses' Groups (N=60).

Knowledge about leadership competencies		Pre program N=60				Post program N=60				P value	
		Verbal		Visual		Verbal		Visual		Verbal P1	Visual P2
		NO	%	NO	%	NO	%	NO	%		
Groups of total score of leadership competencies	Poor leadership Kn.	23	76.7	23	76.7	0	0	0	0	χ^2=36.7, P<0.0001 HS	χ^2=36.7 P<0.0001 HS
	Good leadership Kn.	7	23.3	7	23.3	30	100	30	100		
Total		30	100	30	100	30	100	30	100		

P1=Comparison between Verbal learning style nursing group in pre and post program.
P2= Comparison between Visual learning style nursing group in pre and post Program.

Table (2) demonstrated that pre program, both verbal and visual learning style nurses' groups had less than one quarter (23.3% for each)good leadership knowledge, while the majority of them had poor leadership Knowledge with similar percentage in both nurses visual as well as verbal groups(76.7% for each). The table also revealed the effect of leadership competencies program in improving the leadership competencies good knowledge from 23.3% pre to 100% post program for each group and the difference was high significantly (P<0.0001 for each group).

Table3:

The Comparison between of pre and post leadership competencies program regarding leadership mean score among both the Visual and Verbal Learning style nurses' groups (N=60).

Leadership total scores	Pre- program N=60		Post program N=60		Test of sig. and P value	
	Verbal Mean± SD	Visual Mean± SD	Verbal Mean± SD	Visual Mean± SD	Verbal	Visual
Leadership knowledge total score	10.6± 1.2	10.7±1.5	16.0 ±0.9	17.5±1.2	Paired t test=19.3 P<0.0001 HS	Paired t test=23.11 P<0.0001 HS
Total (N0.)	30	30	30	30		

Table (3) highlights that Post program revealed a highly significant improvement for leadership mean score (P<0.0001 for each) for visual learning style group as well as verbal learning style group. Also, The post program' mean knowledge for leadership competencies was increased from (10.6**)** pre to (16.0) post program for verbal learning style group and increased from (10.7**)** pre to (17.5) post program for visual learning style group.

Table 4:

The effect of leadership competencies program on grand total Innovation score, among both the Visual and Verbal Learning style nurses' groups pre and post program (N=60).

Innovation		Pre- program N=60				Post program N=60				Test of sig. and P value	
		Verbal		Visual		Verbal		Visual		P1	P2
		N0	%	N0	%	N0	%	N0	%		
Groups of Grand total score of innovation	Low	29	96.7	28	93.3	0	0	0	0	LR=56.2 P<0.0001 HS	LR=58.1 P<0.0001 HS
	Moderate	1	3.3	2	6.7	4	13.3	1	3.3		
	High	0	0	0	0	26	86.7	29	96.7		
Total		30	100	30	100	30	100	30	100		

P1=Comparison between Verbal nursing group in pre and post program.
P2= Comparison between Visual nursing group in pre and post program.

Table (4) highlighted no high levels of innovation at preprogram as the majority of nurses had low level of innovation for both visual and verbal learning style group. While post program, there was no low level of innovation for both tow groups. The table also revealed the great effect of leadership competencies educational program in improving the high level of innovation from 0.0% pre for each group to 86.7% for verbal learning style group and to 96.7% for visual learning style group post program. Eventually, the difference was high significantly (P<0.0001 for each group) regarding grand total score of innovation pre and post program.

Table 5.:
The Comparison between pre and post leadership competencies program regarding Innovation mean grand total score , among both the Visual and Verbal Learning style nurses' groups (N=60).

Innovation total scores	Pre- program N=60		Post program N=60		Test of sig. and P value	
	Verbal Mean± SD	Visual Mean± SD	Verbal Mean± SD	Visual Mean± SD	Verbal	Visual
Innovation mean grand total score	32.9 ±2.9	34.1 ±3.4	60.3 ±5.0	64.9 ±5.2	Paired t test=24.6 P<0.0001 HS	Paired t test=28.4 P<0.0001 HS
Total (N0.)	30	30	30	30		

Table (5) highlighted that Post program revealed a highly significant improvement regarding Innovation mean grand total score (P<0.0001 for each) for visual learning style group as well as verbal learning style group .In addition, the Innovation mean grand total score increased from (32.9) preprogram to (60.3) post program for verbal learning style group and increased from (34.1) preprogram to (64.9) post program for visual learning style group. .

Table 6:
The Comparison between the Visual and Verbal learning style nurses' groups post program regarding Leadership competencies knowledge and Innovation mean score (N=60).

Leadership & Innovation total scores	Post program N=60		Test of sig.	P value	
	Verbal Mean± SD	Visual Mean± SD			
Leadership knowledge total score	16.0 ±0.9	17.5±1.2	t=5.4	P=0.001	HS
Innovation grand total score	60.3 ±5.0	64.9 ±5.2	t=3.5	P<0.001	HS
Total (N0.)	30	30			

Table (6) revealed a highly significant difference (P=0.001   ) between the visual and verbal learning style nurses' groups regarding leadership competencies knowledge mean score post program. Moreover, the difference was highly significant (P<0.001) between the visual and verbal learning style nurses' groups regarding innovation mean grand total score post program. In addition, the high mean regarding leadership competencies knowledge was for visual learning style nurses' groups (17.5). Also, the high mean regarding innovation (64.9**)** was for visual learning style nurses' group. Thus, from these results the visual learning style is more effective than verbal learning style regarding the results.

Discussion

Innovation activities have become incredibly significant in today's world, where research studies are rising and new scientific knowledge is produced. Thus, nurses should have creative, equipped, leadership role and risk-taking personality traits to develop innovative solutions (Yıldız et al.,2019). Nurses with leadership competencies have a positive and significant effect on patient, personnel and organizational level outcomes. Thus, nursing education needs identifying and integration of leadership competencies as developments in health care ask for well-trained nurse leaders (Heinen et al.,2019). Clearly, there are various learning styles which aid in learning and education process. Thus, the nursing educators should emphasize the use of this information in their teaching methods to improve learning skills among the nursing learners (Homood et al, 2017). The current study aimed to evaluate the impact of leadership competencies program for nurses on their innovation through Schoology platform by using two learning styles (visual learning style versus

verbal learning style). The result showed that the mean age of visual and verbal groups of nurses was nearly similar. Similar trend was observed concerning mean years of experience so the difference was not significant statistically. Majority of studied nurses were females, residence in rural areas, and had Master degree.

Leadership Competencies Knowledge

The study findings showed that the majority of both visual and verbal learning style nurses' groups had poor leadership competencies knowledge preprogram. These results may be due to the concept of leadership competencies is consider new trend for them, as they didn't have it in the undergraduate and post graduate curriculum. Moreover the learning based on competencies in nursing begins recently only for undergraduate nursing students. So, the study sample didn't know about what it competency, domains and the importance of leadership competencies for them, patient and hospitals.The result of current study is supported with Hassan et al (2020). This study revealed that Preprogram charge nurses had poor level of knowledge and competency of clinical leadership. In the same line, Alomairi et al. (2018) study reported that first-line nurse managers show a low rating competence. Furthermore, Al-Dossary et al. (2016) study support the study result. The study highlighted that new Saudi graduate nurses who did not participate in residency program on leadership skills had low levels of leadership skills. On the opposite, Elsayed et al.(2021) who performed a study in Egypt about the relation among leadership competencies, workplace civility climate, and mental well-being for nurses. This study reported that more than half of the sample was satisfied with nursing leaders' competencies. Regarding the result related to the effect of leadership competencies program on nurses' knowledge. The study revealed that all nurses in both groups had good knowledge regarding the leadership competencies and the difference between pre and post program was high significantly. Also, the mean knowledge for leadership competencies was increased for visual learning style group as well as verbal learning style group. So, Post program revealed a highly significant improvement for leadership mean score for both two groups of nurses. By this result, the first study hypothesises was accepted; as a result of program about leadership competencies, revealed a highly significant difference between knowledge test score of nurses' leadership competencies after the program implementation compared to before for both visual and verbal learning style group of nurses. These results may be due to that by developing this program; nurses' knowledge was improved as they had learned the basic concept related to leadership competencies. Nurses are equipped well with domains, competencies, key elements, and basic requirements related to leadership competencies to be professional competent nurse leader. Moreover, they show educational videos and clinical situations which enhance the learning process. This study result is consistent with study done by Hassan et al. (2020). This study revealed that immediately after application of successful clinical leadership competency program, it was significantly improved their leadership knowledge and competency. Results revealed that post program there are significant change of charge nurses' managing services knowledge of clinical leadership. Really ,their knowledge changed from preprogram poor level to good level post program of clinical leadership. In the same line, this study result supported by study done by Al-Dossary et al. (2016). It is revealed that new Saudi graduate nurses participate in residency programs were significantly more likely to show higher levels of leadership skills, thus, attending a residency program was associated with significant increase in clinical leadership skills. Furthermore, Savage et al. (2014) asserted that professional leadership training expands individuals' networks and has multiple organizational benefits. Also, Eun HaChoi et al. (2018) study reported that the educational leadership was significantly positively correlated with team effectiveness and organizational communication satisfaction.

Innovation

Regarding innovation, the study result highlighted that there are no high levels of innovation at preprogram as the majority of nurses had low level of innovation for both visual and verbal learning style group of nurses. The assumption that the concept of innovation is still fairly recent could be one explanation for this result. Moreover, the subject of innovation is firstly developed in business then become relatively begins in the health field. Nurses not learn about it .This study's findings correspond to those of similar study done by Ahmed et al. (2019) study. This study revealed a slightly less than half of nurses have a high average level of innovative work behavior. This study

explained this finding as the concept of innovation behavior is relatively new. In the same line, the study results is supported by Kamel and Aref (2017) study which aim to explore staff nurses' perception about organizational culture and its relationship to innovative work behavior at critical care units . This study reported that half of staff nurses have highly innovative work behavior. As well, this finding is consistent with that of this study which done by Le et al. (2015). This study found that the vast majority of participants had a low level of innovation behavior (96.88%). Moreover, the finding of the current study was supported by Tung et al. (2014), who indicated that most of the respondents (74.48%) had not been taught about innovation and innovative behavior. Thus, they might not realize what nursing innovation behavior is and why it is important. While this study finding was in inconsistent with Elsayed et al. (2020) study. The purpose of this study was to assess the role of work locus of control and inclusive leadership on nurses' innovative work behavior. It is revealed that (69.1%) of nurses mentioned that the level of innovative work behavior was moderate on their work setting. Also, the study result is in disagreement with Abo Gad (2020) study. As this study revealed that nurses had a high mean of innovative behavior. In the same line Abd ElFattah (2017) study found that more than half percentage of participants had scored moderate percentage as regards the perceived innovation behavior. Regarding the effect of leadership competencies program on innovation mean grand total score, among both the visual and verbal learning style nurses' groups pre and post program. Post program revealed a highly significant improvement regarding innovation mean grand total score for visual as well as verbal learning style group .In addition, the innovation mean grand total score was increased post intervention for visual group as well as verbal learning style group. By this result, the second hypothesis was accepted. As there is a difference in scores of nurses' innovation after the program implementation compared to before for both visual and verbal learning style nurses' groups. It might be explained by the fact that by developing leadership competencies program, nurses' knowledge regarding leadership competencies increased which is reflexed on their innovation. This may be due to leadership competencies prepare nurses to be creative, open mind, problem solver, and critical thinker. These skills are essential requirements for innovation. Similarly, the findings of a study by Doğan (2021) backed with the findings of the current study. This study stated that regular training, role modeling, and scientific activities that explain the innovation process make the process more engaging, and guide nurses are critical for activating the innovation process in nursing. Also, this study reported that awareness of the innovation process was considered to be sufficient. Also, Stephenson (2017) supported these results by focusing on the importance of a significant link between critical thinking skills and leadership effectiveness. Clearly, Hafsteinsdóttir et al. (2017) discovered a positive impact of leadership programs and mentoring for postdoctoral nurse researchers on leadership skills and knowledge improvement. In the same line, Abo Gad (2020) study support the result. The study reported that there were significant influences of nurse managers' leadership practices, staff nurses' personal and organizational characteristics on their innovative behavior. Similarly, Asurakkody and Shin (2018) concluded that innovative behavior can be encouraged through nursing leadership and management which resulted in numerous benefits like increase self-efficacy, solving problems, and decrease job burnout among nurses.

Schoology Platform, Visual Learning Style and Verbal Learning Style

By developing leadership competences program through Schoology platform plus using the visual and verbal learning style, the result revealed that both the visual and verbal learning style nurses' groups had a high mean regarding leadership competencies knowledge as well as innovation at post program. By this result, the first and second study hypothesizes were accepted. The finding of the study is due to various clarifications plus the previous reasons that reported. One of these clarifications is the vital role of using e-learning based on Schoology platform in the learning and teaching process. Clearly, Al-Enezi (2021) study supported the study results. As this study reported that the necessity of directing those responsible for preparing training programs at the Ministry of Education to use interactive e-learning platforms as one of the training methods and methods. In the same line, the study result was supported by Dalhem (2014) study. The purpose of this study was to assess the impact of e-learning on nurses' professional knowledge and practice. The research results, displaying that the majority percent of the subjects were involved in courses had enhanced their business skills, such as interpersonal communication skills, effective time management, leadership curriculum, and management curriculum. Also, this study stated that nursing personnel can effectively use e-learning at work as a technological educational tool,

allowing them to efficiently complete their work needs. Furthermore, Abbas (2020) highlighted the importance of Schoology's application in e-learning. As Schoology has proven to be an effective, simple, and accessible learning management system platform for e-learning and blended learning. Also, the study suggested that educational institutions should use media and technology in their teaching processes. Schoology aided students in learning the materials, doing the exercises first before attending class, and facilitating task collection. Purnomo et al. (2018) in the same line demonstrated that Schoology is an important learning platform in calculus courses. Furthermore, another clarification of the current study results is the importance of knowing the favorable learning style for learners. Thus, by using learning style that nurse like it enhance the learning and teaching process. It might be explained by the fact that every human has preferred learning styles which aid in gaining the knowledge. Similarly, Somji (2018) stated that people processes information uniquely, so trainers and teachers should understand the different learning styles. With knowledge of favorite learning style of learners, teachers will be able to tailor their teaching to suit their students or trainees. In the same line, there is a strong relationship between the learning style preferences and academic achievements. Learning styles help teachers to facilitate students effectively. Thus, students itself find the best method of learning and get good performance in the academics. Most of higher education students continually improved or changed the learning styles for getting good performance in their academics. Most of the students follow the learning styles of good students especially in higher education (Ahmef et al., 2017). Moreover, Nayak et al. (2015) supported the result as they emphasize that awareness of student learning style could provide a basis to optimize teaching method. Learning style diversity can enable more students to achieve success. Regarding the comparison between the visual and verbal learning style nurses' groups. The result revealed a highly significant difference between the visual and verbal learning style nurses' groups regarding leadership competencies knowledge mean score and innovation mean grand total score post program. In addition, visual learning style nurses' group had the high mean regarding leadership competencies knowledge and innovation. Thus, from these results the visual learning style is more effective than verbal learning style. By this result, the third study hypothesizes was accepted; as a result of educational program about leadership competencies, revealed a highly significant difference between the visual and verbal learning style nurses' groups post program. Also, visual learning is more effective than verbal learning. It might be explained by the fact that visual learning style has great advantages. One of these advantages is that the images and pictures are one of the basics of human perception. Thus, by using visual learning style, the leaners begins the learning process with viewing images and recording them in the brain and expressing them in various forms and means. Also, visual aids was attractive for leaners as the program contents was presented in figure, charts, pictures, diagrams, and sketches. Those help learner to gain knowledge and understand the learning content. The study result is in agreement with pallapu (2007). This study asserted that academically, the visual learners maintained higher academic success rates. This study reinforces the importance of meeting individual learners' learning styles in an educational setting as well as instructor awareness and curriculum enhancements possibilities. Similarly, Homood et al.(2017) study indicated that the high percentage of the nursing students regarding the most common learning preferences was visual learning style. Also, this study concluded that the visual, active, and sequential styles are the commonest learning preferences among the nursing students. Furthermore, Felder and Solomon (2007) supported the study results. The study asserted that visual learning style is effective in providing learners with a combination of information in a various verbal ways can help their learning and increased learners' ability to recall what they see. In the same line, Somji (2018) reported that in the visual learning style the learners understand information effectively when visual aids are demonstrated such as, pictures, film clips, colors and diagrams. They're also adept at interpreting evidence supplied visually in maps, charts, and graphs. In another view, the study result is opposite to study done by Bokhari (2021). This study reported that medical education participants commonly used kinesthetic styles, and there is no difference among different year of study. Also, the study reported that learning approach; multimodal has increased as year of studying increased. Moreover, Bulent et al. (2015) study highlighted that there is increase demand for multimodal learning which is preferred methods of learning in clinical setting where the teaching methods changes to discussion and problem based learning and more focus on practical as well as reduced amount of lecture time. Thus, the nursing educators should emphasize the use of learning style information in their teaching methods to improve learning skills among the nursing students. Educators have to be aware of their students' preferred learning styles. This could help in advancing the science of nursing education and may aid in

building and creating evidence-based culture (Homood et al., 2017).

Conclusion

In the light of the present study findings, it can be concluded that developing the leadership competencies program for nurses has led to improve their knowledge regarding leadership competencies which reflexed on innovation improvement after implementation. The result demonstrated that preprogram, the majority of visual and verbal learning style nurses' groups poor leadership knowledge and low level of innovation. The result also highlighted that Post program revealed a highly significant improvement regarding Innovation mean grand total score as well as leadership competencies for visual group as well as verbal learning style group. On the other hand, the study result findings revealed a highly significant difference between the visual and verbal learning style nurses' groups regarding leadership competencies knowledge mean score as well as innovation mean score. In addition, the high mean of these was for visual learning style nurses' group. Thus, from these results the visual learning is more effective than verbal learning.

Recommendation

Based on the literature review and the findings of this study, the following recommendations are proposed

- In-service training programs and workshops about leadership competencies should be conducted continuously and provided on regular basis for all nurses' level should be recommended.
- Theoretical and practical courses outline of leadership competencies and innovation must be emphasized in the undergraduate as well as post graduate course by using different educational strategies to prepare candidates to apply its key elements where they work.
- Collaboration between health care institutions and academic expertise should be assured in order to help in developing leadership competencies and innovation.
- Nursing Educators have to be aware of their learners' preferred learning styles for helping in advancing the science of nursing education.
- In-service training programs and workshops about visual learning style should be provided to nursing learners.
-In-service training programs and workshops about the suitable teaching methods for visual learning style should be conducted continuously and provided on regular basis for all nurses' educators.

Limitations

The most important limitation of this study is that the research data were only from nurse who enrolled in postgraduate studies. Therefore, selecting sample from different nursing levels recommended for future studies to generalize the findings.

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Conflict Of Interest

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References

Abbas A. H.(2020). Reasons Why We Should Use Schoology in E-Learning: A Review Paper. Generation of Literary and Intellectual Studies Issue 65 Page 123, University of Wasit, Wasit, Iraq

Abd El-Fattah, M.A. (2017). Innovation behavior levels and its relation with TIGER-Based nursing informatics competencies among critical care nurses. Egyptian Nursing Journal; 14: 59-69.

Abo Gad R. A.S. A.(2018).The Influence of Nurse Managers' Leadership Practices and Organizational Characteristics on Staff Nurses' Innovation: A Comparative Study IOSR Journal of Nursing a nd Health Science (IOSR-JNHS) e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 7, Issue 5 Ver. V. (Sep.-Oct .2018), PP 73-86 www.iosrjournals.org

Ahmed,A., Ata,A., and Abd-Elhamid,Z. (2019): "Relationship between the Leadership Behaviors, Organizational Climate, and Innovative Work Behavior among Nurses." American Journal of Nursing Research, vol. 7, no. 5 870-878. doi: 10.12691/ajnr-7-5-20.

Ahmad N.A.,Jelas,Z.M,andAli,M.M.(2011). The relationship between learning styles and strategies with academic achievement based on gender and type of school,"InternationalJournalof Learning,vol.17,no.10,pp.265–278,2011.

Al-Dossary RN, Kitsantas P, Maddox PJ.(2016). Residency programs and clinical leadership skills among new Saudi graduate nurses. J Prof Nurs. 2016;32(2): 152-58.

Al-Enezi, Ahmed assistant profit Manhal Muhammad. (2021). The effectiveness of a training program based on interactive e-learning platforms in developing the skills of using augmented reality applications among middle school teachers in Kuwait. Journal of the College of Education - Alexandria University, 31(1), 21-60. doi: 10.21608/jealex.2021.155212

Alhathli M. A. E., Masthoff J. F. M., Beacham N. A. (2018). The effects of learners' verbal and visual cognitive styles on instruction selection, in Proceedings of Intelligent Mentoring Systems Workshop Associated With the 19th International Conference on Artificial Intelligence in Education, AIED 2018 (London:). [Google Scholar]

Ali, I. (2018). Personality traits, individual innovativeness and satisfaction with life. Journal of Innovation & Knowledge; 4: 38-46. Forthcoming 2018.

Alomairi S, El Seesy N & Rajab A. (2018): Managerial and leadership competencies of first-line nurse managers in Makkah City: Mixedmethod approach. IOSR Journal of Nursing and Health Science.; 7(1), 53- 60, e-ISSN: 2320–1959

American Nurses Association (ANA) (2013). Competency Model. Retrieved from: https://learn.ananursingknowledge.org/template/ana/publications_pdf/leadershipInstitute_ competency_model_brochure.pdf

Andreou C, Papastavrou E, Merkouris A.(2014). Learning styles and critical thinking relationship in baccalaureate nursing education: a systematic review. Nurse Education Today. 2014;34(3):362–371. doi: 10.1016/j.nedt.2013.06.004. [PubMed] [CrossRef] [Google Scholar]

Asurakkody TA, Shin SY.(2018). Innovative behavior in nursing context: a concept analysis. Asian Nurs Res. 2018;12(4):237–44. https://doi.org/10.1016/j.anr.2018.11.003. Article Google Scholar

Bokhari NM, Zafar M. (2021).Learning styles and approaches among medical education participants. J Edu Health Promot [serial online] 2019 [cited 2021 Sep 16];8:181. Available from: https://www.jehp.net/text.asp?2019/8/1/181/268119

Bulent A, Hakan K, Aydin B.(2015). An analysis of undergraduates' study skills. Procedia Soc Behav Sci 2015;197:1355-62]

Canadian Nursing Association (CNA). (2009).Nursing Leadership Position Statement. Retrieved from: https://www.cna-aiic.ca/~/media/cna/page-content/pdf-en/nursing-leadership_position-statement.pdf?la=en

Dalhem W. A., Saleh N.(2014). The impact of eLearning on nurses' professional knowledge and practice in HMC.Canadian Journal of Nursing Informatics. Volume 9 2014

Doğan Merih Y. C2021).The Roles of Innovative Nurses in the COVID-19 during the Pandemic and Difficulties They Experience. J Educ Res Nurs. 2021;18(Supp. 1): 69-75. DOI: 10.5152/jern.2021.60420

Elsayed W. A., Abdel-Ghani A. M. & Ibrahim A. A.(2020) .The Role of Work Locus of Control and Inclusive Leadership on Nurses' innovative Work Behavior.Vol , (8) No, (20), Supplement March, 2020, pp (124-133) 124.

Elsayed W. A., Hassona F. M., Nageeb S. M.,and Mohamed B.E.S. (2021).Leadership Competencies, Workplace Civility Climate, and Mental Well-being in El- Azazi Hospital for Mental Health, Egypt Egyptian Journal of Health Care, 2021 EJH vol. 12 no. 2

Eun Hachoi, Eun-Kyung K, Pil Bong K.(2018). Effects of the educational leadership of nursing unit managers on team effectiveness: Mediating effects of organizational communication. Asian Nurs Res. 2018;2(12): 99-105.

Fealy GM, McNamara MS, Casey M, Geraghty R, Butler M, Halligan P, et al. (2011).Barriers to clinical leadership development: findings from a national survey. J Clin Nurs. 2011;20: 13-14:2023-2032. doi: 10.1111/j.1365-2702.2010.03599.x. Epub 2011 Mar 25.

Felder, R. M. , & Solomon, B. A. (2006). Index of Learning Styles. Retrieved on August6, 2006, from http://www.engr.ncsu.edu/learningstyles/ilsweb.html

Felder, R. M. , & Solomon, B. A. (2007). Learning styles and strategies. Retrieved on January 6, 2007, from http://www.ncsu.edu/felder-public/ILSdir/styles.htm29. A. Paivio, Imagery and Verbal Processes, Holt, Rinehart & Winston, New York, 1971.

Ghorbani M, Ghamari Zare Z, Haghani F, Purfarzad Z. (2016).Situational Leadership in Clinical Education of Nursing Students. JNE. 2016; 5 (4):8-19. URL: http://jne.ir/article-1- 715-fa.html. Persian.

Hafsteinsdóttir TB1, van der Zwaag AM2, Schuurmans MJ. (2017).Leadership mentoring in nursing research, career development and scholarly productivity: A systematic review. Int J Nurs Stud. 2017;75:21-34. doi: 10. 1016/j.ijnurstu.2017.07.004. Epub 2017 Jul 6.

Hahn CA, Gil Lapetra M. (2019).Development and Use of the Leadership Competencies for Healthcare Services Managers Assessment. Front Public Health. 2019 Feb 28;7:34. doi: 10.3389/fpubh.2019.00034. PMID: 30873397; PMCID: PMC6403121.

Hassan H. A., Shabaan F. A., El-Demerdash S A. (2020). Efficacy of Application of Clinical Leadership Competencies Program on Charge Nurses Based on Self Need Assessment. Tanta Scientific Nursing Journal. Vol. 19 No. 1 November , 2020).

Heinen, M., van Oostveen C., Peters, J., Vermeulen, H., & Huis, A. (2019). An integrative review of leadership competencies and attributes in advanced nursing practice. Journal of advanced nursing, 75(11), 2378–2392. https://doi.org/10.1111/jan.14092

Hill, Linda A., Brandeau, Greg, Emily Truelove, and Kent Lineback. (2014). Collective Genius, the Art and Practice of Leading Innovation. Boston: Harvard Business Review Press.

Homood A. Alharbi, Adel F. Almutairi, Eyad M. Alhelih, Abdualrahman S. Alshehry.(2017). "The Learning Preferences among Nursing Students in the King Saud University in Saudi Arabia: A Cross-Sectional Survey", Nursing Research and Practice, vol. 2017, ArticleID 3090387, 7 pages, 2017. https://doi.org/10.1155/2017/309038 7

Hozni, S., Hakkak, M., Vahdati, H., Nazarpouri, A. (2019). Nursing leadership competency learning-an integrative review. Future of Medical Education Journal, 9(4), 46-54. doi: 10.22038/fmej.2019.13984

James K.(2016). Incorporating complexity science theory into nursing practice. Creative Nursing. 2010; 16: 137-142.

Kalil, S., Abd-Elrhaman, E., & Sliman,W. (2019): Relationship among Nurses 'Locus of Control, Work Motivation Factors, and Their Organizational Commitment. American Journal of Nursing Research,, Vol. 7, No. 2, 167-178, DOI:10.12691/ajnr-7-2-8

Kamel, F.F., & Aref, M.A. (2017). Staff nurses perception toward organizational culture and its relation to innovative work behavior at critical care units. American Journal of Nursing Science; 6(3):251-260.

Kozioł-Nadolna, Katarzyna. (2020). The Role of a Leader in Stimulating Innovation in an Organization. Administrative Sciences. 10. 59. 10.3390/admsci10030059

Kvas A., Seljak J., and Stare J. (2014). Training Needs Assessment for Leaders in Nursing Based on Comparison of Competency Models.DOI: 10.2478/orga-2014-0006 Organizacija, Volume 47 Research papers Number 1, February 2014 https://www.researchgate.net/publication/284517863

Lee E, Daugherty J, Hamelin T.(2019). Reimagine health Care leadership, challenges and opportunities in the 21st Century. Journal of Peri Anesthesia Nursing. 2019;34(1): 27-38.

Le VT, Akkadechanunt T, Chontawan R (2015). Factors related to innovation behavior among nurses in Tertiary General Hospitals, the Central Region, and The Socialist Republic of Vietnam. Nurs J 42:2.

Low, P. (2017). E-learning implementation in foundation English class: Learners' perspectives and learning achievement. International Journal of Computer Theory and Engineering, 9(4), 285-289.

Lukes, M. & Stephan, U. (2017). Measuring Employee Innovation: A Review of Existing Scales and the Development of the Innovative Behavior and Innovation Support Inventories across Cultures. International Journal of Entrepreneurial Behavior & Research,. 23 (1), 136 – 158.

Mangold, K., Kunze, K. L., Quinonez, M. M., Taylor, L. M., & Tenison, A. J. (2018). Learning Style Preferences of Practicing Nurses. Journal for nurses in professional development, 34(4), 212–218. https://doi.org/10.1097/NND.0000000000000462

Manning, C., Brooks, W., Crotteau, V., Diedrich, A., Mosser, J., & Zwiefelhofer, A. (2011). Tech tools for teachers by teachers: Bridging teachers and students. Wisconsin English Journal. 53(1). pp. 24-28.

McCrow J, Yevchak A, Lewis P.(2014). A prospective cohort study examining the preferred learning styles of acute care registered nurses. Nurse Education in Practice. 2014;14(2):170–175. doi: 10.1016/j.nepr.2013.08.019. [PubMed] [CrossRef] [Google Scholar]

Meeks F. Clinical staff nurse leadership: Identifying gaps in competency development, Nurs Forum. 2018; 53(1):35-39.doi: 10.1111/nuf.12217. Epub 2017 Jul 26.

Meyer, RM., S. VanDeVelde-Coke and K. Velji (2011), "Leadership for health system transformation: what's needed in Canada? Brief for the Canadian Nurses Association's National Expert Commission on the health of our nation - the future of our health system," Canadian Journal of Nursing Leadership 24(4): 21-30.

Nayak VJ, Indudhara PB, Girish HO, Yenni VV. (2015). Assessment of preferred learning modalities of undergraduate medical students using the visual-aural-read/write-kinesthetic questionnaire and the impact of gender. J Adv Clin Res Insights 2015;2:135-9.

Pallapu, Prasanthi. (2007). Effects of Visual and Verbal Learning Styles onLearning.https://www.researchgate.net/publication/253993178_Effects_of_Visual_and_Verbal_Learning_Styles_on_Learning

Phillips, R. A., McNaught, C., & Kennedy, G. (2010). Towards a generalised conceptual framework for learning: the Learning Environment, Learning Processes and Learning Outcomes (LEPO) framework. In J. Herrington & W. Hunter (Eds.), ED-MEDIA 2010 (pp. 2495–2504). Proceedings of the 22nd annual World Conference on Educational Multimedia, Hypermedia & Telecommunications, Toronto, Canada, 28 June–2 July. Chesapeake VA: Association for the Advancement of Computers in Education https://www.researchgate.net/publication/229046302_Towards_a_generalised_conceptual_framework_for_learning_the_Learning_Environment_Learning_Processes_and_Learning_Outcomes_LEPO_framework/citation/download

Purnomo, M., Machromah, I. & Sari, C. (2018). Using Schoology in Calculus Course. The International Conference on Mathematical Analysis, Its Applications and Learning.

R.J. Riding.(2001). The nature and effects of cognitive style. In R. J. Sternberg & L. Zhang (Eds.), Perspectives on thinking, learning, and cognitive styles (pp. 47-72), Erlbaum, Mahwah, NJ, 2001.

Saleh, M. A. K., & K.R., M. (2021). Embracing Entrepreneurial Change: Enterprising In Yemen Compared With Other Least Developed Countries. Journal of Advanced Research in Economics and Administrative Sciences, 2(4), 1-22. https://doi.org/10.47631/jareas.v2i4.336

Savage GT, Duncan WJ, Knowles KL, Nelson K, Rogers DA, Kennedy KN. (2014). Inter professional academic health center leadership development: the case of the University of Alabama at Birmingham's Healthcare Leadership Academy. Appl Nurs Res. 2014;27(2):104-1088. doi: 10.1016/ j.apnr.2013.07.001. Epub 2013 Aug 29.

Schumpeter JA. (1934).The theory of economic development: an inquiry into profits, capital, credit, interest, and the business cycle. Champaign, IL: University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship; 1934, 1p.

Somji R. (2018). Teaching Strategies for the 8 Different Learning Styles. Avaliable at https://virtualspeech.com/blog/teaching-strategies-different-learning-styles

Stare, J. (2009). Competency Models for Public Administration and Leadership Development. In M. Vintar & P. Pevcin (Eds.), Contemporary Issues in Public Policy and Administrative

Organisation in South East Europe (pp. 262–276). Ljubljana: University of Ljubljana, Faculty of Administration.

Stare, J. & Seljak, J. (2013). Vodenje ljudi v upravi (2. pona-tis) [Leadership in administration (2th edition)]. Ljubljana: University of Ljubljana, Faculty of Administration

Stephenson CG. (2017) Assessment of leadership effectiveness, management experience, and core competences of nurse administrators in healthcare settings. [PhD thesis]. Capella University; 2017

Tung L, Akkadechanunt T, Chontawan R (2014). Factors related to innovation behavior among Nurses in Tertiary General Hospitals, the Central Region, the Socialist Republic of Vietnam. Nurs J 41:2.

Weberg D.(2009). Innovation in healthcare: a concept analysis. Nurs Adm Q. 2009 Jul-Sep;33(3):227-37. doi: 10.1097/NAQ.0b013e3181accaf5. PMID: 19546742.

Yıldız A., M.,Akyol Y.E.,Demiral M. (2019) Innovation in Nursing and Innovative Attitudes of Nurses, International Health Administration and Education (Sanitas Magisterium), 5(2), 52-59.

Zaghini F, Fiorini J, Piredda M, Fida R, Sili A. The relationship between nurse managers' leadership style and patients' perception of the quality of the care provided by nurses: Cross sectional survey. Int J Nurs Stud. 2020 Jan;101:103446. doi: 10.1016/j.ijnurstu.2019.103446. Epub 2019 Oct 7. PMID: 31670220.

Tanui, P. . (2021). Effect of Institutional Ownership on Financial Performance in Kenya: Moderated Mediation Role of Capital Structure and Corporate Diversification. Journal of Advanced Research in Economics and Administrative Sciences, 2(4), 23-39. https://doi.org/10.47631/jareas.v2i4.354

Appendix 1

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