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Technology Leadership Self-Efficacy: The Case of Lebanese Private School Principals

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Abstract:
The aim of this study was to investigate technology leadership self-efficacy for Lebanese private school principals in the administrative work as well as in teaching and learning. For this purpose, an extensive review of the literature of self-efficacy was conducted which constituted the base for the generation of a survey instrument consisting of two sections: Section A is composed of 16 administrative tasks related to technology leadership and section B is composed of 16 teaching and learning tasks related to technology leadership. The questionnaire was sent to 117 Lebanese private schools. The total sample consisted of 117 school principals (N= 117) and 207 teachers (N=207). School principals were requested to rate how certain they are that they can do each of the 32 tasks related to technology leadership right now. Regarding teachers, they were asked to identify the extent to which principals are practicing and performing each of these technology leadership activities right now. Data was analyzed using SPSS 21.0 for windows. The study results provided a positive image about technology leadership self-efficacy for Lebanese private school principals. These principals are certain that they can do the technology leadership activities related to the administrative work and to teaching and learning. According to teachers, the principals are doing these activities well. However, teachers' data were not as positive as those provided by the school principals. Thus, this shows that technology leadership self-efficacy and skills for Lebanese school leaders could be further boosted. Limitations of the study are mentioned and suggestions for future research are presented. The study offers recommendations to help school leaders enhance their technology leadership self-efficacy and skills.

Keywords: *Social cognitive theory, self-efficacy, self-esteem, self-concept, school principals, technology leadership*

1. Introduction

The social cognitive theory, which emerged from the work of Albert Bandura, is one of the most frequently used health behavior theories. It describes a dynamic, ongoing process where personal factors, environmental factors, and human behavior all interact. This theory asserts that people learn not only from their own experiences, but also by observing the actions of others and the benefits of those actions (Denler et al., 2014; Redmond, 2010). Social cognitive theory is composed of four interrelated components of goal realization: self-observation, self-evaluation, self-reaction and self-efficacy. Each of the four components has an effect on the ones' motivation and his/her goal achievement (Redmond, 2010).

The social cognitive theory is widely used in diverse areas of human functioning. Denler and others (2014) assured that this theory "has been applied broadly to such diverse areas of human functioning as career choice, organizational behavior, athletics, and mental and physical health. SCT also has been applied extensively by those interested in understanding classroom motivation, learning, and achievement" (p. 1).

Self-efficacy is a key element of the social cognitive theory of Albert Bandura (Raoofi et al., 2012; Tılfarlıoğlu & Cinkara, 2009; Van Dinther et al., 2011). It is defined by Bandura (1994) as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. Self-efficacy beliefs determine how people feel, think, motivate themselves and behave. Such beliefs produce these diverse effects through four major processes. They include cognitive, motivational, affective and selection processes" (p.1).

Hongu and others (2011) stated that "Self-efficacy is one of the most important determinants of whether behavioral change takes place (initial condition), because, unless people believe that they can produce desired effects by their actions, they have little incentive to act for behavioral change. Self-efficacy also affects whether people mobilize the motivation and perseverance needed to succeed (improvement condition), and finally, their ability to recover from failures and relapses, and how well they continue their behavior changes once their goals have been achieved (maintenance condition)." (p.2).

2. Purpose of the Study and Research Questions

2.1. Purpose of the Study

Self-efficacy is about how confident people are that they can currently do a specific task (Bandura, 1994, 1997, 2006). Therefore, "High self-efficacy in one area may not coincide with high self-efficacy in another area. Self-efficacy is specific to the task being attempted. However, having high self-efficacy does not necessary mean that individuals believe they will be successful. While self-efficacy indicates how strongly individuals believe they have the skills to do well, they may believe other factors will keep them from succeeding" (Nandeshwar & Jayasimha, 2010, p. 42).

People with low self-efficacy toward a specific task are more likely to avoid it, while those who believe they are capable are more likely to participate and be intrinsically motivated (Artino, 2012; Kirk, 2013; Knotts, 2014; Nandeshwar & Jayasimha, 2010; Tyagi & Misra, 2011).

"Moreover, individuals who feel efficacious are hypothesized to expend more effort and persist longer in the face of difficulties than those who are unsure of their capabilities. The tendency for efficacious people to 'expend more effort and persist longer' is of particular importance because most personal success requires persistent effort. As such, low self-efficacy becomes a self-limiting process. In order to succeed, then, individuals need a strong sense of task-specific self-efficacy, tied together with resilience to meet the unavoidable obstacles of life" (Artino, 2012 p.78).

This study aimed to:

1. Identify how confident the Lebanese private school principals are about their capability to currently do specific technology leadership tasks related to the administrative work at schools –through the school principals' lens.
2. Identify how certain the Lebanese private school principals are about their capability to currently do specific technology leadership tasks related to teaching and learning –through the school principals' lens.
3. Determine how much these principals are really doing specific technology leadership tasks related to the administrative work and to teaching and learning at their school –through the teachers' lens.
4. Furnish the recommendations to improve technology leadership self-efficacy and skills for Lebanese private school principals in the administrative work and in teaching and learning.

2.2. Research Questions

This study is designed to explore the following questions:

1. How much the Lebanese private school principals are confident that they can currently do specific technology leadership tasks related to the school's administrative work (through school principals' lens)?
2. How much these school principals are certain that they can currently perform specific technology leadership tasks related to teaching and learning (through school principals' lens)?
3. To what extent do these principals practice and perform –right now– specific technology leadership tasks related to the administrative work and to teaching and learning at their school (through teachers' lens)?
4. What are the recommendations that can be furnished to enhance principals' technology leadership self-efficacy and skills in the administrative work and in teaching and learning?

3. Literature Review

3.1. Bandura's Four Sources of Self-Efficacy

Bandura (1994, 1997) claimed that people's beliefs about their efficacy can be improved by four main sources of influence: mastery, modeling, persuasion, and physiological/affective states.

3.1.1. Mastery Experiences

Bandura (1994, 1997) believed that the most effective way to develop a strong sense of efficacy is through mastery experiences. According to the author, performing a task successfully strengthens one's sense of self-efficacy. However, failing to adequately deal with a task or challenge can undermine and weaken one's personal efficacy. Indeed, no matter how minor the failure is, a huge blow could occur. That is why self-efficacy is fragile when left on its own.

Bandura (1994, 1997) assured that success leads toward additional successes, and failure can spread its negative influence on the outcome of future attempts. When a person succeeds at something, he/she is more likely to challenge it again.

Therefore, people's successful experiences (students, school staff, principals or others) boost self-efficacy, while failures erode it. Based on Bandura's belief, mastery experiences are the most effective source of developing personal efficacy.

3.1.2. Vicarious Experiences

Bandura (1994, 1997) considered that self-beliefs of efficacy can also be strengthened through the vicarious experiences provided by social models. According to the author, witnessing other people successfully completing a task can raise self-efficacy by reinforcing the observer's belief that he/she is also capable of accomplishing the same task.

However, the observer can develop low self-efficacy vicariously through other people's performances. Bandura (1994, 1997) argued that observing others' failure despite high effort (or seeing others similar failure) can lower observers' judgments of their self-efficacy

and undermine their efforts. Therefore, observing a peer (student, teacher, supervisor, school principal or another person) succeed at a task can strengthen beliefs in one's own abilities.

3.1.3. Social Persuasion

Bandura (1994, 1997) considered the social or verbal persuasion as another way that influences one's perception of self-efficacy. Indeed, the beliefs of personal efficacy can be affected by the encouragement, or discouragement, of other people, especially those whose opinions are greatly respected (i.e. peers, coaches, mentors, significant others, superiors). It can transpire when a person receives feedback or listens to speeches from others, and it can also occur from people's expectations or even one's self-talk.

Bandura (1994, 1997) stated that using positive verbal persuasion –such as a school principal telling a teacher: *"You really can do it. I have confidence in you. Go ahead."*– can lead people to put forth more effort; therefore, they are likely to mobilize great effort to succeed. He added, if the verbal persuasion is negative –such as a school leader saying to the teacher, *"This is shameful! I thought you could handle this task."*– it can lead to doubts about oneself; therefore, they tend to avoid challenging tasks that cultivate potentialities and to give up quickly in the face of difficulties.

3.1.4. Physiological and Emotional States

Bandura (1994, 1997) assured that people judge their own efficacy by partly relying on their physical and emotional states. In other words, moods, emotional states and physical reactions can positively/negatively affect people's judgments of their personal abilities. According to the author, a positive mood can enhance one's beliefs in self-efficacy, while anxiety or stress can diminish it.

Indeed, if a school principal is extremely nervous or anxious before speaking in public then this may develop a weak sense of self-efficacy in such situations.

Bandura (1994, 1997) argued that people can enhance their self-efficacy by learning how to decrease stress and promote a positive mood while facing definite difficulties or challenging tasks. In this context, teachers are asked to help students improve their self-efficacy by reducing stressful situations and lowering anxiety-surrounding events like summative exams or oral presentations.

Therefore, Bandura (1994, 1997) noted that the fourth way for modifying personal efficacy beliefs is by reducing people's stress and altering their negative emotions. Adding to that, enhancing physical status and correcting misinterpretations of bodily states can also strengthen self-beliefs of efficacy.

3.2. Characteristics of Self-Esteem and Self-Efficacy

Table 1 lists seven characteristics for each of high/low self-esteem and high/low self-efficacy. This table is adapted from Frank (2011), *The pillars of the self-concept: Self-esteem and self-efficacy* and from Walker (2013), *Self-efficacy and the art of doing things*.

Characteristics of High Self-Esteem	**Characteristics of Low Self-Esteem**
Taking responsibility for themselves and acknowledging their mistakes	Having feelings of unhappiness
Having a strong sense of purpose, being committed to goals in life and striving for excellence (not for perfection)	Tending to evaluate one's self based upon comparisons to other people (feelings of anxiety)
Being honest with themselves and others (emotionally and intellectually)	Having feelings of inferiority or superiority (intellectually, financially, or spiritually)
Forgiving themselves and others	Internal self-talk is usually negative (negative self-talk hurts one's self-efficacy)
Having internally-based values (rather than externally-based values)	External manifestations (criticizing one's self to others or excessively apologizing or commenting about negative observations) could be noticed by others
Being positive with an appreciative and grateful attitude towards life	Being impatient or easily irritated by mistakes (this is directed at the self or at others)
Striving towards self-improvement	Determining goals in life based upon what others might want or need (taking care of others while their needs are not addressed)
Characteristics of High Self-Efficacy	**Characteristics of Low Self-Efficacy**
Approaching situations with a sense of one's ability to be successful (self-confidence)	Unwilling to take risks or try new things without a guarantee of success (fear of risks and uncertainty)
Being able to accurately evaluate one's performance (neither overly-critical nor overly positive) in order to pursue self-improvement	Losing confidence easily and giving up quickly
Forming a strong sense of commitment to one's interests (without going half-way, or starting projects and giving up quickly)	Trying to hide mistakes from others (rather than learn from them)
Understanding that taking calculated risks increases the chances of success (willingness to take reasonable risks)	Putting a great deal of energy into behaving in a way to obtain approval from others
Viewing mistakes as opportunities to improve one's self	Feeling not capable but trying to present a competent image to others
Feeling a sense of accomplishment due to the willingness to take risk and to pursue interests	Focusing on one's personal failings (not giving credit to one's self)
Developing deep interests and being active participants in various activities	Believing difficult things are beyond one's abilities (seeing other people doing things and assuming the position of observer, not participant)

Table 1: The four 7s: Characteristics of high/low self-esteem and high/low self-efficacy

3.3. Difference between Self-Efficacy, Self-Esteem and Self-Concept

Rosen et al. (2010) says that "Although definitions of self-esteem vary, most accounts refer to a person's general sense of self-worth. Self-efficacy, the belief in one's ability to succeed in specific situations, is distinct from self-esteem in that success in a specific situation may or may not be related to one's sense of self-worth" (p.94). Thus, self-esteem and self-efficacy are not synonyms.

According to Frank (2011), these two concepts "do tend to correspond so that a person who is low in one is more likely to be low in the other. But it is also possible to have low self-esteem and yet have high self-efficacy" (p.1).

Therefore, one may tend to be overly critical and very negative about oneself; yet he/she sees himself/herself as quite capable in certain areas. For instance, this person might see oneself as uninteresting and unlikeable but see oneself as a productive school principal. A teacher who believes he/she has the ability to perform well on managing classrooms may have very low self-esteem if this teacher looked to other things, such as the number and closeness of friends, to determine one's self-worth. Likewise, a student could have low academic self-efficacy but high self-esteem if the student's performance in music played a greater role in his/her evaluation of his/her own self-worth.

Regarding self-concept, Huitt (2011) stated that it is often known as the cognitive or thinking component of one's self (related to one's self-image) and generally refers to the totality of a complex, organized, and dynamic system of learned beliefs, attitudes and opinions that an individual hold to be true about one's personal existence. Generally, self-concept embodies the answer to the question *"Who am I?"* (e.g. *"I am a qualified school principal"*).

Regarding self-efficacy, it is a social cognitive process based on observational learning and social experience in one's personality development (1994, 1997), while self-esteem is more often "used to refer to the affective or emotional aspect of self and generally alludes to how one feels about or how values him- or herself" (Huitt, 2011, p.1). McLeod (2008) assured that self-esteem refers to how much the person values, likes, accepts or approves of oneself. According to the author, it always involves a degree of self-evaluation that may have either a positive or a negative view (e.g. *"I feel good about being a qualified school principal"*). Table 2 lists the approaches, questions and major sources influencing self-concept, self-esteem and self-efficacy.

Self-Concept	**Self-Esteem**	**Self-Efficacy**
Cognitive or descriptive component of one's self	Affective or evaluative component of one's self	Social cognitive process: observational learning and social experience in one's personality development
What do I think about myself? *Who am I?*	How do I feel about myself (positive or negative evaluations of myself)? *Am I a good/bad person?*	How can I approach goals, tasks, and challenges? *Am I confident I can do a certain task?*
- Physical description - Social roles - Personal traits - Existential statements (abstract ones)	- Others' reaction - Comparison with others - Social roles - Identification	- Mastery experiences - Vicarious experiences - Social persuasion - Physiological & affective states

Table 2: Approaches, questions and main sources of influence

3.4. Bandura's Self-Efficacy Theory: Related References in Education

Pajares (2009) stated that "Self-efficacy has been the focus of research in areas as diverse as business, athletics, medicine and health, media studies, social and political change, moral development, psychiatry, psychopathology, and international affairs. In psychology, it has been the focus of studies on clinical problems such as phobias, depression, social skills, assertiveness, smoking behavior, and moral development" (p.1). According to the author, "self-efficacy has been especially prominent in educational research" (p.1) where the scholars concentrated on the students-teachers-principals' self-efficacy in order to improve students' achievements. Some of these authors and researchers are listed in table 3.

Authors & Researchers	Date	Self-Efficacy Target
Artino, A. R.	2012	Students
Banfield, J. & Wilkerson, B.	2014	Students
Benoit, V.	2014	Teachers
Bouchamma, Y. ; Basque, M. & Marcotte, C.	2014	School leaders
Careau, J.	2008	Teachers
Coulibaly, M. & Karsenti, T.	2013	Teachers
Denler, H.; Wolters, C. & Benzon, M.	2014	Teachers
De Stercke, J., Temperman, G., De Lièvre, B., & Lacocque, J.	2014	Teachers
Doyon, P. R.	2014	Teachers
Dussault, M. ; Villeneuve, P. & Deaudelin, C.	2001	Teachers
Gaudreau, N. ; Royer, E. ; Beaumont, C. & Frenette, E.	2012	Teachers
Kirk, K.	2013	Students
Margolis, H. & McCabe, P. P.	2006	Students
Pajares, F.	2009	Teachers
Patterson, J. L. & Kelleher, P.	2005	School leaders
Petridou, A. & Nicolaidou, M.	2012	School leaders
Raoofi, S.; Hoon Tan, B. & Heng Chan, S.	2012	Students
Rosen, J.A.; Glennie, E.J.; Dalton, B.W.; Lennon, J.M. & Bozick, R.N.	2010	Teachers
Safourcade, S. et Alava, S.	2009	Teachers
Silverman, S. & Davis, H.	2009	Teachers
Smith, J. R.	2009	School leaders
Smith, W.; Guarino, A.; Strom, P. & Adams, O.	2006	School leaders
Tai, D.W.S. ; Hu, Y-C. ; Wang, R. & Chen, J-L.	2012	Teachers
Tılfarlıoğlu, F. Y. & Cinkara, E.	2009	Students
Tschannen-Moran, M. & Gareis, C. R.	2004	School leaders
Tschannen-Moran, M. & Woolfolk Hoy, A.	2001	Teachers
Van Dinther, M.; Dochy, F. & Segers, M.	2011	Students
Vilkas, B. & McCabe, C.	2014	Students
Wegman, A. A. & Dixon, R. J.	2011	Teachers
Williams, J. C.	2012	School leaders

Table 3: Authors and researchers in education who referred to Bandura's self-efficacy theory

3.5. 12 Strategies Successful People Can Employ to Strengthen Personal Efficacy

Based on Bandura's self-efficacy theory, many authors studied several ways to help people boost their sense of self-efficacy. Referring to LeVan (2010) and Patterson & Kelleher (2005), 12 strategies can be suggested to be used by everyone (school principals, teachers, and other people outside the school):

1. Building one's sense of mastery to appraise his/her experience and to learn from it –this allows the person to become more self-reflective and more "grounded" in what is important
2. Setting and achieving specific, attainable and assessable short-term goals and benchmarks of progress to chunk out long-term, complex plans into manageable increments that will help the person sustain motivation, avoid distractions, and recognize success
3. Claiming small achievements to sustain efficacy over time
4. Reflecting on past successes before moving on to the next future goals can help drum up a greater sense of self-efficacy
5. Visualizing to believe –it not only primes one's brain for success and enhances self-efficacy but it also helps the person to see the smaller steps needed to reach one's end goal
6. Recovering quickly from setbacks to keep a bump in the road from becoming a major pothole
7. Maximizing the benefits of positive emotions and lessening the costs of negative feelings –when having a bad mood, the person can write out all the things that uplift him/her (i.e. special songs, favorite quotes, etc) and use them as advantage to navigate towards certain goals
8. Accepting and controlling one's self-doubt –when self-defeating thoughts bubble up, the person should accept them as part of the process and move on because these types of thoughts don't necessarily reflect one's true capabilities
9. Finding good role models to vicariously bolster one's sense of self-efficacy –when the person sees someone else succeed, especially someone whom he/she identifies with, he/she is more apt to learn from him/her
10. Believing in the power of the team and letting faith in the capability of one's colleagues sustain the person in moments of personal doubt and uncertainty
11. Maintaining strong workplace relationships turning to trusted friends and confidantes at work for counsel and support during hard moments
12. Maintaining strong personal relationships with people outside the workplace to sustain personal efficacy over time

3.6. Impact of Principal Self-Efficacy on School Effectiveness

Smith and others (2006) identified 14 items to explore the principals' self-efficacy beliefs in "management" and in "instructional leadership". According to them, principals' self-efficacy influences the effectiveness of teaching and learning in the school environment because they have strong beliefs in their abilities to:

1. Influence teachers to utilize effective teaching and learning practices
2. Provide effective modeling for teachers regarding effective teaching and learning practices
3. Use research on teaching and learning to guide strategic planning for accomplishment of school goals
4. Plan effective activities and experiences that facilitate teachers' beliefs in their abilities to provide effective teaching and learning activities to their students
5. Use data collected from teacher observations to inform school-wide efforts for improving teaching and learning
6. Regularly perform effective observations of teachers
7. Stay abreast of current best practices for facilitating effective teaching and learning
8. Communicate needs and goals necessary to enhance effective instructional effectiveness to faculty
9. Provide experiences that foster and facilitate high levels of teacher motivation towards teaching and learning
10. Protect instructional time so that effective teaching and learning can take place
11. Facilitate an atmosphere that provides fair and consistent discipline for all students
12. Maintain healthy school/community relations
13. Maintain a school-wide atmosphere that is conducive to teaching and learning
14. Buffer teacher from unnecessary paperwork

Tschannen-Moran and Gareis (2004) identified 18 items to evaluate principals' self-efficacy influence on the effectiveness of teaching and learning. These items are categorized into three main areas: management, instructional leadership and ethical leadership. According to them, principals' self-efficacy influences the school effectiveness because they have strong beliefs in their abilities to:

Efficacy for Management	Handle the time demands of the job.
	Handle the paperwork required of the job.
	Maintain control of one's own daily schedule.
	Prioritize among competing demands of the job.
	Cope with the stress of the job.
	Shape the operational policies and procedures that are necessary to manage the school.
Efficacy for Instructional Leadership	Motivate teachers.
	Generate enthusiasm for a shared vision for the school.
	Manage change in the school.
	Create a positive learning environment in the school.
	Facilitate student learning in the school.
	Raise student achievement on standardized tests.
Efficacy for Ethical Leadership	Promote acceptable behavior among students.
	Promote school spirit among a large majority of the student population.
	Handle effectively the discipline of students in the school.
	Promote a positive image of the school with the media.
	Promote the prevailing values of the community in the school.
	Promote ethical behavior among school personnel.

Table 4

3.7. Some Strategies that Can Be Employed by Teachers to Improve Students' Self-Efficacy

Margolis and McCabe (2006) proposed concrete suggestions regarding how to develop students' self-efficacy. They separated these tips into two main areas based on Bandura's sources of personal efficacy. The first area involves drawing on enactive mastery experiences and vicarious observation of others' performance (modeling), while the second area suggests ways for using verbal persuasion through permanent and regular feedback.

What to Do *Mastery Experiences & Observational Learning*	**What to Say** *Verbal Persuasion & Continuous Feedback*
Plan and use moderately challenging tasks	Reinforce effort and correct strategy use
Use peer models	Encourage students to try
Teach specific learning strategies	Stress recent successes
Capitalize on students' choice and interest	Give frequent, focused, task-specific feedback
Allow students to make their own choices and decisions	Encourage functional and accurate attribution statements

Table 5: Margolis and McCabe strategies used to improve students' self-efficacy

4. Methodology

4.1. Research Tool

Data was collected via a questionnaire for the purpose of quantitative research. Based on an extensive review of the literature on "self-efficacy", the researcher developed a questionnaire consisting of 32 items. It was also based on several references related to school staff professional development, active learning, learning-school leadership, and principal's technology leadership (Al-Jammal & Ghamrawi, 2013; Center for Teaching Excellence-CTE, 2014; Duncan, 2011; Eison, 2010; Grady, 2011; International Society for Technology in Education, 2009; Norton & Kelly, 2013; TSSA Collaborative, 2001).

The survey instrument consisted of two sections: A and B. Section A was composed of 16 administrative tasks related to technology leadership and section B was composed of 16 teaching and learning tasks related to technology leadership. The questionnaire was sent to private school principals who were requested to rate how certain they are that they can do each of these 32 activities.

The response scale used for measuring technology leadership self-efficacy for school principals was adapted from the "Guide for constructing self-efficacy scales" elaborated by Bandura (2006). "In the standard methodology for measuring self-efficacy beliefs, individuals are presented with items portraying different levels of task demands, and they rate the strength of their belief in their ability to execute the requisite activities. They record the strength of their efficacy beliefs on a 100-point scale, ranging in 10-unit intervals from 0 ("Cannot do"); through intermediate degrees of assurance, 50 ("Moderately certain can do"); to complete assurance, 100 ("Highly certain can do"). A simpler response format retains the same scale structure and descriptors but uses single unit intervals ranging from 0 to 10" (p. 312).

Based on Bandura's response scale, the questionnaire sent to school principals was composed of two columns. The left column 'Items' included different technology leadership activities while the right one 'Confidence' included the rating degree. This rating showed how much the participant is confident for the activity he/she can do right now. Using the scale given below, the respondent was asked to rate the degree of confidence by recording a number from 0 to 100.

	0	10	20	30	40	50	60	70	80	90	100
Cannot do at all		*Moderately certain can do*				*Highly certain can do*					

Moreover, the questionnaire sent to private school teachers asked them to identify the extent to which principals are practicing and performing right now the 16 administrative tasks and the 16 teaching and learning tasks related to technology leadership. Teachers referred to the same response scale used by school principals.

Note that the instrument was piloted on a sample comprised of 10 principals and 25 teachers. Therefore, few amendments for language and syntax were introduced.

4.2. The Sample

The sample of this research was composed of 130 private schools located in Beirut and some regions of the Mount-Lebanon Governorate. Participants from each of those schools were the principal and 2 teachers. Thus, the sample consisted of 390 respondents: 130 principals and 260 teachers. Along with the survey, a cover letter and an informed consent form were attached in addition to the full contact information of the researcher. The cover letter detailed the purpose of the study and the guarantee of anonymity for participants and how data will be used.

Principals and teachers are asked to complete the questionnaire and return it along with the signed consent form, to the given address by regular mail, or as a scanned document via email or fax. If this way is not available, respondents were invited to return the questionnaire along with the signed consent form to the assistant researcher. Only 362 surveys were returned, out of which 324 questionnaires were usable: 117 questionnaires for principals and 207 questionnaires for teachers.

Note that the empirical work of this study was conducted between 14th January and 28th February 2015.

4.3. Data Analysis

Data was analyzed using SPSS 21.0 for windows. Descriptive statistics were used to describe and summarize the properties of the mass of data collected from the respondents. Means scores, standard deviations and percentages were calculated per each item of the survey instrument.

5. Interpretation of Results

This part of the study includes the following two sections:

- School principals' data: Rating the technology leadership self-efficacy for school leaders in the administrative work and in teaching and learning (self-rating)
- Teachers' data: Rating of performing the technology leadership tasks in administrative work and in teaching and learning right now by school principals (through teachers' lens)

5.1. School Principals' Data: Rating the Technology Leadership Self-efficacy for School Leaders in the Administrative Work and in Teaching and Learning (Self-Rating)

Table 6 shows the descriptive statistics for the school principals' data about rating the strength of school principals' belief in their ability to do the requisite technology leadership activities related to the administrative work right now –through their own lens.

Items	N	Mean	Std. Deviation
1	117	79.57	9.684
2	117	78.72	9.427
3	117	78.72	9.427
4	117	78.72	9.427
5	117	78.29	9.939
6	117	77.44	9.206
7	117	76.58	9.207
8	117	76.92	9.601
9	117	76.67	9.649
10	117	78.03	9.934
11	117	74.10	12.809
12	117	70.51	16.859
13	117	79.57	9.504
14	117	74.10	12.809
15	117	70.51	16.859
16	117	80.43	9.039

Table 6: Descriptive statistics about the rating of the strength of school principals' belief in their ability to do the requisite technology leadership activities related to the administrative work right now –through their own lens

Table 6 shows that the mean score value of the 16 items varied between 70.51 and 80.43. The mean score of the items is as follows (respectively):

- Items 12 and 15: M=70.51, SD=16.859
- Items 11 and 14: M=74.10, SD=12.809
- Item 7: M=76.58, SD=9.207; Item 9: M=76.67, SD=9.649; Item 8: M=76.92, SD=9.601
- Item 6: M=77.44, SD=9.206
- Item 10: M=78.03, SD=9.934; Item 5: M=78.29, SD=9.939; Items 2, 3 and 4: M=78.72, SD=9.427
- Item 1: M=79.57, SD=9.684; Item 13: M=79.57, SD=9.504
- Item 16: M=80.43, SD=9.039

Therefore, the school principals are certain that they can do right now the 16 activities related to technology leadership in the administrative work. These activities are listed in table 7.

	Activities	**Rating Scales**										
	How much am I confident for the activity I can do right now?	*0*	*10*	*20*	*30*	*40*	*50*	*60*	*70*	*80*	*90*	*100*
1	Participating in formulating the school vision and objectives that define the expectations of technology usage in administrative work	0	0	0	0	0	1	10	21	46	39	0
2	Putting a dynamic, organized and developed plan to achieve the school vision in order to create a technological campus equipped with the needed materials for the administrative field	0	0	0	0	0	1	7	33	41	35	0
3	Providing many activities and ways for administrative staff's professional development that focus on the effective use of technology in the administrative work (formal training sessions, workshops, professional books and articles, attending conferences, exchanging experiences among colleagues in school, benefitting from more experienced colleagues at the school, visiting other schools to benefit from their administrators' experiences and from their administrative developed system)	0	0	0	0	0	1	7	33	41	35	0
4	Using information technology in solving administrative problems and making administrative decisions	0	0	0	0	0	1	7	33	41	35	0
5	Using information technology to put strategic plans for the school which aim to develop its administrative system	0	0	0	0	0	2	10	27	45	33	0
6	Challenging the status quo and changing the employees' attitudes which maintain the traditional administrative practices for the benefit of the use of advanced technology in the administrative work	0	0	0	0	0	1	7	41	40	28	0
7	Participating in professional development activities that focus on how to use the technology in the school's administrative work	0	0	0	0	0	1	8	46	37	25	0
8	Being a model for administrative staff through using technology effectively in the administrative area	0	0	0	0	0	1	11	38	40	27	0

9	Communicating with everybody (superiors, administrative staff, and parents) to convince them about the effective usage of technology in the administrative work. In other words, changing their mentalities and attitudes and making them excited about computerizing the school's administrative work	0	0	0	0	0	1	12	38	40	26	0
10	Providing the school with human, financial and material resources (programs, equipment and offices) to use the most advanced technology in the administrative area	0	0	0	0	0	1	13	26	45	32	0
11	Practicing appropriate strategies to assess the administrative staff's performance in their use of modern technology	0	0	0	0	1	14	8	32	37	25	0
12	Refining the administrative staff's needs to use technology appropriately (based on the assessment of their knowledge, attitudes and skills in the administrative area)	0	0	0	0	22	1	5	32	35	22	0
13	Integrating technology at the school to ensure rapid and effective communication between the administration and all concerned parties for management purposes (informing the teachers about transferring their salaries to their bank account, announcing school holidays, announcing registration dates for pupils, determining the duration allocated for the payment of school fees, possibility of completing the pupils' registration by their parents through school's websites, etc.)	0	0	0	0	0	1	6	31	38	41	0
14	Using social networking to communicate meaningfully with others which will influence positively the school administrative technological skills (communicating with other school principals, affiliating to professional organizations, participating in training sessions, enrolling in university courses specialized in the technological fields)	0	0	0	0	1	14	8	32	37	25	0
15	Motivating the school administrative staff to use social networks to communicate meaningfully with others which will influence positively their school administrative technological skills (communicating with colleagues in other schools, affiliating to professional organizations, participating in training sessions, enrolling in university courses specialized in the technological areas)	0	0	0	0	22	1	5	32	35	22	0
16	Recognizing and honoring the great efforts and creative ideas of the administrative staff which aim at supporting and developing the administrative school system	0	0	0	0	0	0	9	18	49	41	0

Table 7: Frequency results about the rating of the strength of school principals' belief in their ability to do the requisite technology leadership activities related to the administrative work –through their own lens

Table 7 shows that all the 117 participants are certain that they can do right now 12 of the 16 activities related to technology leadership in the administrative work (Items 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, and 16). This table also shows that almost all the respondents (116 principals) are confident for two other activities that they can do right now (Items 11 and 14). Concerning the remaining two activities (Items 12 and 15), the vast majority of participants (95 principals) believe in their ability to do them.

According to table 7, the overwhelming majority of school principals (their number varied between 103 and 110 respondents) rated their strong belief in their ability to execute 12 of the 16 tasks from 70/100 to 90/100 (Items 10, 9, 5, 8, 1, 7, 16, 2, 3, 4, 6, and 13). In addition, the vast majority of principals (their number varied between 89 and 94 respondents) rated their confidence in their ability to do the 4 remaining tasks from 70/100 to 90/100 (Items 12, 15, 11, and 14).

Conversely, table 7 shows that none of the 117 school principals is uncertain that he/she can do 12 of the 16 tasks. Indeed, nobody rated his/her belief in his/her ability to do them less than 50/100. According to table 7, only 1 participant chose a grade of 40/100 for his/her confidence in his/her ability to do two other tasks (Items 11 and 14). Regarding the remaining two tasks (Items 12 and 15), 22 participants chose the same grade for their certainty to do them. However, none of the 117 principals chose a grade of 100/100 to rate his/her confidence in his/her ability to do any of the 16 tasks listed in table 7.

Table 8 lists the descriptive statistics for the school principals' data about rating the strength of school principals' belief in their ability to execute the requisite technology leadership activities related to teaching and learning right now –through their own lens.

Items	N	Mean	Std. Deviation
1	117	76.58	9.207
2	117	76.92	9.601
3	117	74.02	11.895
4	117	70.77	16.036
5	117	76.58	9.207
6	117	76.92	9.601
7	117	74.02	11.895
8	117	70.77	16.036
9	117	79.57	9.684
10	117	79.57	9.684
11	117	79.57	9.504
12	117	74.10	12.809
13	117	79.57	9.504
14	117	74.10	12.809
15	117	70.51	16.859
16	117	80.43	9.039

Table 8: Descriptive statistics about rating the strength of school principals' belief in their ability to execute the requisite technology leadership activities related to teaching and learning right now –through their own lens

Table 8 shows that the mean score value of the 16 items varied between 70.51 and 80.43. The mean score of the items is as follows (respectively):

- Item 15: M=70.51, SD=16.859; Items 4 and 8: M=70.77, SD=16.036
- Items 3 and 7: M=74.02, SD=11.895; Items 12 and 14: M=74.10, SD=12.809
- Items 1 and 5: M=76.58, SD=9.207; Items 2 and 6: M=76.92, SD=9.601
- Items 9 and 10: M=79.57, SD=9.684; Items 11 and 13: M=79.57, SD=9.504
- Item 16: M=80.43, SD=9.039

Therefore, the school principals are certain that they can do right now the 16 activities related to the use of technology in teaching and learning. These activities are listed in table 9.

Activities		Rating Scales										
How much am I confident for the activity I can do right now?		*0*	*10*	*20*	*30*	*40*	*50*	*60*	*70*	*80*	*90*	*100*
1	Participating in formulating the school vision and objectives that define the expectations of technology usage in its teaching and learning activities	0	0	0	0	0	1	8	46	37	25	0
2	Putting a dynamic, organized and developed plan to achieve the school vision in order to create a cooperative community that uses modern technology in the development of the learning environment	0	0	0	0	0	1	11	38	40	27	0
3	Providing many activities and ways for teachers' professional development that focus on acquiring required knowledge and skills related to modern technology in order to improve students' achievements (formal training sessions, workshops, professional books and articles, attending conferences, exchanging classroom visits among colleagues at school, benefitting from more experienced colleagues at the school, visiting other schools to benefit from their teachers' experiences)	0	0	0	0	4	4	10	44	33	22	0
4	Participating in different professional development opportunities that focus on integrating technology in teaching and learning activities	0	0	1	4	7	6	10	36	33	20	0
5	Being a model for teachers and students through using modern technology effectively in teaching and learning processes	0	0	0	0	0	1	8	46	37	25	0
6	Communicating with everybody (superiors, parents, students, and teachers) to convince them about the effective usage of technology in enhancing students' achievements	0	0	0	0	0	1	11	38	40	27	0
7	Providing the school with human, financial and material resources (programs, equipment and rooms) to use the most advanced technology in teaching and learning processes	0	0	0	0	4	4	10	44	33	22	0
8	Offering possibility for all students and teachers to use technology at school (ensuring that the school offers an equal access to technology for everyone)	0	0	1	4	7	6	10	36	33	20	0

9	Providing responsible and useful usage of educational technology through the identification of legal and ethical practices to users, and through taking the needed technical measures to protect the morals of users	0	0	0	0	0	1	10	21	46	39	0
10	Providing the protection of the users' confidentiality and rights through taking appropriate technical measures for educational purposes	0	0	0	0	0	1	10	21	46	39	0
11	Using suitable strategies to evaluate the teachers' performance in their technology usage in the activation of teaching and learning processes	0	0	0	0	0	1	6	31	38	41	0
12	Identifying the teachers' needs for using technology appropriately (based on the assessment of their current knowledge, attitudes and skills)	0	0	0	0	1	14	8	32	37	25	0
13	Integrating technology at the school in order to provide better communication and greater cooperation between everyone leading to improved students' achievements: teachers/teachers, teachers/pupils, pupils/pupils, teachers/parents, etc.	0	0	0	0	0	1	6	31	38	41	0
14	Using social networks meaningfully which leads to the contribution to the development of knowledge and skills in teaching and learning technology (communicating with principals of other schools, affiliating to professional organizations, participating in training sessions, enrolling in university courses specialized in the technological areas)	0	0	0	0	1	14	8	32	37	25	0
15	Motivating the school staff to use social networks meaningfully which helps to develop their knowledge and skills in teaching and learning technology (communicating with colleagues in other schools, affiliating to professional organizations, participating in training sessions, enrolling in university courses specialized in the technological areas)	0	0	0	0	22	1	5	32	35	22	0
16	Recognizing and honoring the great efforts and creative ideas of teachers –in using modern technology– which help in supporting and developing the teaching and learning environment at the school	0	0	0	0	0	0	9	18	49	41	0

Table 9: Frequency results about rating the strength of school principals' belief in their ability to execute the requisite technology leadership activities related to teaching and learning –through their own lens

Table 9 shows that all the 117 participants are certain that they can do right now 9 of the 16 activities related to the use of technology in teaching and learning (Items 1, 2, 5, 6, 9, 10, 11, 13, and 16). This table also shows that almost all the respondents (their number varied between 113 and 116 principals) are confident for 4 other activities that they can do right now (Items 3, 7, 12, 14). According to table 9, the vast majority of participants (105 principals) believe in their capabilities to do two other activities (4 and 8). Concerning the remaining activity (Item 15), the vast majority of participants (95 principals) believe in their ability to do it.

According to table 9, the overwhelming majority of school principals (their number varied between 105 and 110 respondents) rated their strong belief in their ability to execute 9 of the 16 tasks from 70/100 to 90/100 (Items 2, 6, 9, 10, 1, 5, 16, 11, and 13). Furthermore, the vast majority of principals (their number varied between 89 and 99 respondents) rated their confidence in their ability to do the 7 remaining tasks from 70/100 to 90/100 (Items 4, 8, 15, 12, 14, 3, 7).

Conversely, table 9 shows that none of the 117 school principals is uncertain that he/she can do 9 of the 16 tasks (1, 2, 5, 6, 9, 10, 11, 13, and 16). Indeed, nobody rated his/her belief in his/her ability to do them less than 50/100. According to table 9, a small minority of participants (their number varied between 1 and 12 principals) chose a grade less than 50/100 for their confidence in their ability to do 6 other tasks (Items 12, 14, 3, 7, 4, and 8). Regarding the remaining task (Item 15), 22 participants chose a grade of 40/100 for their certainty to do it.

However, none of the 117 principals chose a grade of 100/100 to rate his/her confidence in his/her ability to do any of the 16 tasks listed in table 9.

5.2. Teachers' Data: Rating of Performing the Technology Leadership Tasks in Administrative Work and in Teaching and Learning Right Now by School Principals –Through Teachers' Lens

Table 10 lists the descriptive statistics for the teachers' data about the rating of performing the technology leadership tasks related to the administrative work right now by school principals –through teachers' lens.

Items	N	Mean	Std. Deviation
1	207	65.17	26.674
2	207	62.66	25.105
3	207	61.74	25.002
4	207	60.29	25.254
5	207	64.06	26.273
6	207	61.64	24.696
7	207	60.29	24.174
8	207	60.72	24.355
9	207	59.13	24.460
10	207	63.91	26.193
11	207	57.68	24.265
12	207	55.65	24.345
13	207	63.14	25.434
14	207	56.28	24.479
15	207	54.06	24.593
16	207	65.70	26.847

Table 10: Descriptive statistics about the rating of performing the technology leadership tasks related to the administrative work right now by school principals –through teachers' lens

Table 10 shows that the mean score value of the 16 items varied between 54.06 and 65.70. The mean score of the items is as follows (respectively):

- Item 15: M=54.06, SD=24.593
- Item 12: M=55.65, SD=24.345
- Item 14: M=56.28, SD=24.479
- Item 11: M=57.68, SD=24.265
- Item 9: M=59.13, SD=24.460
- Item 4: M=60.29, SD=25.254; Item 7: M=60.29, SD=24.174; Item 8: M=60.72, SD=24.355
- Item 6: M=61.64, SD=24.696; Item 3: M=61.74, SD=25.002
- Item 2: M=62.66, SD=25.105
- Item 13: M=63.14, SD=25.434; Item 10: M=63.91, SD=26.193
- Item 5: M=64.06, SD=26.273
- Item 1: M=65.17, SD=26.674; Item 16: M=65.70, SD=26.847

According to table 10, teachers assured that school principals do the 16 activities related to technology leadership in administrative work right now. These activities are listed in table 11.

Activities		Rating Scales										
To what extent do the school principals do these activities right now?		*0*	*10*	*20*	*30*	*40*	*50*	*60*	*70*	*80*	*90*	*100*
1	Participating in formulating the school vision and objectives that define the expectations of technology usage in administrative work	0	0	41	12	0	2	12	25	61	54	0
2	Putting a dynamic, organized and developed plan to achieve the school vision in order to create a technological campus equipped with the needed materials for the administrative field	0	0	41	12	0	1	8	69	41	35	0
3	Providing many activities and ways for administrative staff's professional development that focus on the effective use of technology in the administrative work (formal training sessions, workshops, professional books and articles, attending conferences, exchanging experiences among colleagues in school, benefitting from more experienced colleagues at the school, visiting other schools to benefit from their administrators' experiences and from their administrative developed system)	0	0	41	12	0	1	27	50	41	35	0
4	Using information technology in solving administrative problems and making administrative decisions	0	0	41	12	0	26	7	45	41	35	0
5	Using information technology to put strategic plans for the school which aim to develop its administrative system	0	0	41	12	1	3	13	31	60	46	0
6	Challenging the status quo and changing the employees' attitudes which maintain the traditional administrative practices for the benefit of the use of advanced technology in the administrative work	0	0	41	13	0	2	8	75	40	28	0

7	Participating in professional development activities that focus on how to use technology in the school's administrative work	0	0	41	12	1	2	28	61	37	25	0
8	Being a model for administrative staff through using technology effectively in the administrative area	0	0	41	12	0	1	31	55	40	27	0
9	Communicating with everybody (superiors, administrative staff, and parents) to convince them about the effective usage of technology in the administrative work; in other words, changing their mentalities and attitudes and making them excited about computerizing the school's administrative work	0	0	41	12	0	26	12	50	40	26	0
10	Providing the school with human, financial and material resources (programs, equipment and offices) to use the most advanced technology in the administrative area	0	0	41	12	1	2	16	30	60	45	0
11	Practicing appropriate strategies to assess the administrative staff's performance in their use of modern technology	0	0	41	12	1	39	8	44	37	25	0
12	Refining the administrative staff's needs to use technology appropriately (based on the assessment of their knowledge, attitudes and skills in the administrative area)	0	0	41	12	22	26	5	44	35	22	0
13	Integrating technology at the school to ensure rapid and effective communication between the administration and all concerned parties for management purposes (informing the teachers about transferring their salaries to their bank account, announcing school holidays, announcing registration dates for pupils, determining the duration allocated for the payment of school fees, possibility of completing the pupils' registration by their parents through school's websites, etc.)	0	0	41	12	0	1	7	67	38	41	0
14	Using social networking to communicate meaningfully with others which will influence positively on the school administrative technological skills (communicating with other school principals, affiliating to professional organizations, participating in training sessions, enrolling in university courses specialized in the technological fields)	0	0	41	12	14	34	8	36	37	25	0
15	Motivating the school administrative staff to use social networks to communicate meaningfully with others which will influence positively their school administrative technological skills (communicating with colleagues in other schools, affiliating to professional organizations, participating in training sessions, enrolling in university courses specialized in the technological areas)	0	0	41	16	31	21	5	36	35	22	0
16	Recognizing and honoring the great efforts and creative ideas of administrative staff which aim to support and develop the administrative school system	0	0	41	12	0	1	11	22	63	57	0

Table 11: Frequency results about the rating of performing the technology leadership tasks related to the administrative work by school principals –through teachers' lens

According to table 11, the majority of teachers (154 of 207 respondents) assured that the school principals do 8 of the 16 activities related to technology leadership in administrative work right now (Items 1, 2, 3, 4, 8, 9, 13, and 16). The majority of teachers (153 respondents) also assured that the principals do 5 of these activities right now (Items 5, 6, 7, 10, and 11). Concerning the remaining 3 activities, the majority of participants (their number ranged between 119 and 140 principals) affirmed that the principals do them at schools (Items 15, 12, and 14).

Moreover, table 11 shows that the majority of teachers (their number varied between 140 and 146 participants) rated the school principals' technology usage in 5 administrative tasks from 70/100 to 90/100 (Items 1, 16, 6, 2, and 13). In addition, the majority of respondents (their number varied between 121 and 137 teachers) rated the principals' technology usage in 6 other administrative tasks from 70/100 to 90/100 (Items 4, 8, 7, 3, 10, and 5). The majority of these teachers rated the school principals' technology leadership in 2 other tasks from 70/100 to 90/100 (Item 11: 106 participants, Item 9: 116 participants). However, the rating of principals' technology leadership in the 3 remaining tasks (Items 15, 14, and 12) by the majority of teachers is less than the grades from "70 to 90" (their number ranged between 93 and 101 respondents).

Conversely, table 11 shows that all the 16 items had grades less than 50/100. The number of teachers who chose a grade less than the average (it ranged between 20/100 to 40/100) varied between 53 and 88 respondents. 53, 54, 67, 75, and 88 teachers respectively gave grades below average for, respectively:

- 8 items (1, 2, 3, 4, 8, 9, 13, and 16)
- 5 items (5, 6, 7, 10, and 11)
- 1 item (14)
- 1 item (12)

- 1 item (15)

Referring to the presented teachers' data, 12, 13, and 16 teachers respectively gave a grade of 30/100 for:

- 14 items (1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, and 16)
- 1 item (6)
- 1 item (15)

According to these data, 41 teachers gave a grade of 20/100 for each of the 16 items. None of the 207 teachers chose a grade of 0/100 or 10/100 to rate the principals' technology usage of any of the 16 tasks. However, none of them chose a grade of 100/100 to rate the principals' technology usage of any of these tasks.

Table 12 lists the descriptive statistics through the teachers' lens about the rating of performing the technology leadership tasks related to teaching and learning right now by school principals.

Items	N	Mean	Std. Deviation
1	207	59.28	24.868
2	207	58.74	25.474
3	207	57.83	24.527
4	207	55.27	24.982
5	207	58.94	24.885
6	207	60.19	24.672
7	207	58.94	24.352
8	207	56.33	24.317
9	207	62.95	26.903
10	207	59.37	27.058
11	207	63.14	25.434
12	207	56.28	24.479
13	207	61.11	25.999
14	207	55.80	24.873
15	207	53.48	25.169
16	206	64.42	26.084

Table 12: Descriptive statistics about the rating of performing the technology leadership tasks related to teaching and learning right now by school principals –through teachers' lens

Table 12 shows that the mean score value of the 16 items varied between 53.48 and 64.42. The mean score of the items is as follows (respectively):

- Item 15: M=53.48, SD=25.169
- Item 4: M=55.27, SD=24.982; Item 14: M=55.80, SD=24.873
- Item 12: M=56.28, SD=24.479; Item 8: M=56.33, SD=24.317
- Item 3: M=57.83, SD=24.527
- Item 2: M=58.74, SD=25.474; Item 5: M=58.94, SD=24.885; Item 7: M=58.94, SD=24.352
- Item 1: M=59.28, SD=24.868; Item 10: M=59.37, SD=27.058
- Item 6: M=60.19, SD=24.672
- Item 13: M=61.11, SD=25.999
- Item 9: M=62.95, SD=26.903
- Item 11: M=63.14, SD=25.434
- Item 16: M=64.42, SD=26.084

According to table 12, teachers considered that school principals do the 16 activities related to technology leadership in teaching and learning right now. These activities are listed in table 13.

Activities		Rating Scales										
To what extent do the school principals do these activities right now?		*0*	*10*	*20*	*30*	*40*	*50*	*60*	*70*	*80*	*90*	*100*
1	Participating in formulating the school vision and objectives that define the expectations of technology usage in its teaching and learning activities	0	0	43	16	2	1	22	61	37	25	0
2	Putting a dynamic, organized and developed plan to achieve the school vision in order to create a cooperative community that uses modern technology in the development of the learning environment	0	0	42	21	5	1	16	55	40	27	0
3	Providing many activities and ways for teachers' professional development that focus on acquiring required knowledge and skills related to modern technology in order to improve students' achievements (formal training sessions, workshops, professional books	0	0	43	16	6	4	24	59	33	22	0

	and articles, attending conferences, exchanging classroom visits among colleagues at school, benefitting from more experienced colleagues at the school, visiting other schools to benefit from their teachers' experiences)											
4	Participating in different professional development opportunities that focus on integrating technology in teaching and learning activities	0	0	43	25	12	6	15	53	33	20	0
5	Being a model for teachers and students through using modern technology effectively in teaching and learning processes	0	0	43	13	9	3	16	61	37	25	0
6	Communicating with everybody (superiors, parents, students, and teachers) to convince them about the effective usage of technology in enhancing students' achievements	0	0	41	15	1	1	27	55	40	27	0
7	Providing the school with human, financial and material resources (programs, equipment and rooms) to use the most advanced technology in teaching and learning processes	0	0	43	12	6	4	17	70	33	22	0
8	Offering possibility for all students and teachers to use technology at school (ensuring that the school offers an equal access to technology for everyone)	0	0	42	18	7	19	15	53	33	20	0
9	Providing responsible and useful usage of educational technology through the identification of legal and ethical practices to users, and through taking the needed technical measures to protect the morals of users	0	0	41	14	6	6	11	23	56	50	0
10	Providing the protection of the users' confidentiality and rights through taking appropriate technical measures for educational purposes	0	0	43	18	14	7	10	23	51	41	0
11	Using suitable strategies to evaluate the teachers' performance in their technology usage in the activation of teaching and learning processes	0	0	41	12	0	1	7	67	38	41	0
12	Identifying the teachers' needs for using technology appropriately (based on the assessment of their current knowledge, attitudes and skills)	0	0	41	12	14	34	8	36	37	25	0
13	Integrating technology at the school in order to provide better communication and greater cooperation between everyone leading to improve students' achievements: teachers/teachers, teachers/pupils, pupils/pupils, teachers/parents, etc.	0	0	41	12	14	1	7	53	38	41	0
14	Using social networks meaningfully which leads to the contribution to the development of knowledge and skills in teaching and learning technology (communicating with principals of other schools, affiliating to professional organizations, participating in training sessions, enrolling in university courses specialized in the technological areas)	0	0	41	21	6	33	8	36	37	25	0
15	Motivating the school staff to use social networks meaningfully which helps to develop their knowledge and skills in teaching and learning technology (communicating with colleagues in other schools, affiliating to professional organizations, participating in training sessions, enrolling in university courses specialized in the technological areas)	0	0	48	14	26	21	5	36	35	22	0
16	Recognizing and honoring the great efforts and creative ideas of teachers –in using modern technology– which help in supporting and developing the teaching and learning environment at the school	0	0	40	12	0	1	16	34	55	48	0

Table 13: Frequency results about the rating of performing the technology leadership tasks related to teaching and learning by school principals –through teachers' lens

According to table 13, the majority of teachers (their number ranged between 150 and 154) affirmed that the school principals do 3 of the 16 tasks related to technology leadership in teaching and learning right now (Items 6, 11, and 16). Moreover, the majority of respondents (their number ranged between 140 and 146 teachers) assured that the principals do 8 of these tasks right now (Items 8, 12, 13, 3, 5, 1, 7, and 9). Referring to the results, the majority of participants (it varied between 132 and 139 teachers) assured that the principals do 3 other tasks (Items 10, 2, and 14). Furthermore, the majority of teachers respectively considered that the school leaders do the 2 remaining tasks: items 15 (119 participants) and 4 (127 participants).

On the other hand, table 13 shows that 132, 137, and 146 teachers respectively gave grades ranging from 70/100 to 90/100 for 3 tasks related to technology leadership in teaching and learning right now (Items 13, 16, and 11).

Moreover, table 13 shows that the majority of teachers (their number varied between 122 and 129 respondents) rated the school principals' technology usage in 6 teaching and learning activities from 70/100 to 90/100 (Items 2, 6, 1, 5, 7, and 9). In addition, the majority of respondents (their number varied between 106 and 115 teachers) rated the principals' technology leadership in 4 other tasks from 70/100 to 90/100 (Items 4, 8, 3, and 10). However, the rating of principals' technology leadership in the 3 remaining tasks (Items 15, 12, and 14) by the majority of teachers is less than the grades from "70 to 90" (their number ranged between 93 and 98).
Conversely, table 13 shows that all the 16 items had grades less than 50/100. The number of teachers who chose a grade less than the average (it ranged between 20/100 to 40/100) varied between 52 and 88 respondents. A minority of teachers (their number ranged between 52 and 57 participants) respectively gave grades below average for 3 tasks related to technology leadership in teaching and learning which are done by school principals right now (Items 16, 11, and 6). Moreover, a minority of respondents (their number varied between 61 and 68 teachers) respectively gave grades below average for 10 other tasks (Items 1, 7, 9, 3, 5, 8, 12, 13, 2, and 14). 75, 80, 88 teachers respectively gave grades below average for the 3 remaining tasks (Items 10, 4, and 15).
Referring to the presented teachers' data, a minority of teachers (their number varied between 12 and 25 participants) gave a grade of 30/100 for each of the 16 tasks while a minority of teachers (their number ranged between 40 and 48 participants) gave a grade of 40/100 for each of these tasks.
None of the 207 teachers chose a grade of 0/100 or 10/100 to rate the principals' technology usage of any of the 16 activities. However, none of them chose a grade of 100/100 to rate the principals' technology usage of any of these activities.

6. Conclusion

This study shows that the school principals have high self-efficacy for accomplishing technology leadership activities related to administrative work and to teaching and learning as well. Indeed, all of the 117 participants or the vast majority is certain that they can do right now the 16 technology leadership tasks related to administrative work and the 16 others related to teaching and learning. Moreover, the vast majority of school principals rated their strong belief in their ability to do the 16 technology leadership tasks in the administrative work right now from 70/100 to 90/100. Similarly, the vast majority rated their strong belief in their ability to do the 16 technology leadership tasks in teaching and learning right now from 70/100 to 90/100.
Teachers' data provided a positive image about practicing the 32 technology leadership activities by school principals. According to teachers, the principals are doing these activities well. However, teachers' data were not as positive as those provided by the school principals. Indeed, the majority of teachers assured that the school principals do all the 16 activities related to technology leadership in administrative work right now. The majority also affirmed that the principals do the 16 other tasks related to technology leadership in teaching and learning right now. However, the majority in the second case is not large enough as the majority of principals. In other words, in the second case, it was a "small" majority. The majority of teachers rated the school principals' technology usage in 13 administrative tasks from 70/100 to 90/100. The majority also rated the principals' technology usage in 13 teaching and learning activities from 70/100 to 90/100. Here also the majority is not vast like that of the school principals. Moreover, the rating of principals' technology leadership in 3 tasks related to the administrative work and in 3 others related to teaching and learning by the majority of teachers is less than the grades from "70 to 90".

7. Limitations and Recommendations

7.1. Limitations and Suggestions for Future Research

The sample of this study is one of the limitations confronting the validity of this study. In fact, geographically, the sample was localized in the *Mohafazat* (Governorate) of Beirut and some regions of Mount-Lebanon *Mohafazat*; the other six Lebanese *Mohafazats* and the other regions of Mount-Lebanon were not represented in the sample. Future research should attempt to involve a larger and more representative sample of school principals and teachers across Lebanon.
In addition, the sample included only private school principals and teachers. No principals and teachers from the public school sector were involved. Future research should involve such participants to have a more comprehensive understanding on the strength of school principals' belief in their ability to do the technology leadership activities related to the administrative work and to learning and teaching right now.
On the other hand, only principals and teachers took part in the sample. In fact, the administrative staff and other school leaders (such as supervisors, coordinators, heads of departments) were not represented in the sample of this study. However, future research should attempt to involve them. Indeed, the variety of information sources could help more to provide a wide objective image about school principals' self-efficacy. For this reason, future study should involve groups of people who were not represented in the sample. In fact, various school customer groups, especially the pupils and their parents, should take part in the sample of future research.
Regarding the methodology, it could have been improved. In fact, the current study has employed the quantitative methodology. It would be more valid to employ the qualitative methodology as well. In other words, the conduction of a semi-structured interview with some school principals and teachers would be an added value for this study because this instrument allows the researcher to have objective perception on the same items of the questionnaire. Future research should take this point into consideration.

7.2. Recommendations

This study provided a positive image about technology leadership self-efficacy for Lebanese private school principals. These principals are certain that they can do the technology leadership activities related to the administrative work. They are also certain that they can do the technology leadership activities related to teaching and learning. According to teachers, the principals are doing these

activities well. However, teachers' data were not as positive as those provided by the school principals. Thus, this shows that technology leadership self-efficacy for Lebanese private school leaders could be further boosted.

Several ways can be proposed to enhance technology leadership self-efficacy and skills for school principals. School principals are motivated to use modeling as a learning tool. Modeling is a form of learning where individuals ascertain how to act or perform by observing other individuals (Bandura, 1994; 1997):

- Principals can take great technology leaders in various fields as learning models. They can read about them or be in direct contact with them to be influenced by their attitudes and behaviors.
- Principals can learn from the experiences of other school principals (peer models). This can be done through several ways, such as engaging in direct discussions or joining a forum online discussion.

In addition, school principals can use behavior-focused strategies, such as self-observation and self-reward (Al-Jammal & Ghamrawi, 2015; Clegg, 2012; Esposito, 2010; Gohari, 2012; Ricketts et al., 2012; Tatum, 2012; Tuovinen, 2010):

- Observing one's own behavior may lead to understand when and why one does specific behaviors, and it may lead the individual to be able to reinforce, change or eliminate certain behaviors.
- Self-reward is about using something tangible or abstract to effectively reinforce desirable behaviors and goal attainments.

School leaders are called to participate in formal training sessions to improve their technology leadership skills and to activate the technology integration in the administrative system and in teaching and learning. These training sessions should help the school leaders to strengthen their self-efficacy in this field. Trainers and superiors are called to reinforce the school leaders' effort to use technology in the administrative work and in teaching and learning. In other word, they should use verbal persuasion through permanent, regular and focused feedback (Margolis & McCabe, 2006).

Moreover, training providers and colleges of education are encouraged to make use of the findings of this study in designing their curricula related to school management (or school leadership), educational supervision, teaching diploma, and training of trainers (ToT).

Finally, it should be noted that the theoretical framework of this research can provide additional strategies and techniques that can be used to strengthen technology self-efficacy and skills of school principals.

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