The effect of Knowledge Characteristics in student's performances:
An Empirical case study

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Abstract: **Knowledge characteristics are the essential step in leveraging knowledge value in the university. Share Document, and contributes knowledge may not be useful without the context provided by experience. This paper focuses on the characteristics of knowledge in applied science private university and its effect on student's performance, which aim to focus in the nature knowledge and the quality of material. Questioner was designed and sent to MIS students in the applied sciences university in order to improve the context of the knowledge and facilitated the knowledge usage in order to improve the student knowledge level. The result lead recommends that the university should understand the knowledge characteristics and the potential techniques that support sharing knowledge. In addition the university should now which type of knowledge can by articulated or which knowledge can be taught to individuals, through training, practices or apprenticeship, in order to improve the student performance.**

Keywords-codify ability, Explicitness, Availability, Teach ability, student performance.

I. INTRODUCTION

. Choi and Lee [10] pointed to four knowledge characteristics based on explicit dimensions. These characteristics are deferent from industry to industry. The organizations should adopt with knowledge characteristics to a chief higher performance. Organizations tend to have a mixed between the knowledge characteristics and human performance. Fernandez[5] study knowledge flows within different industries. Knowledge flows through two major channels, the disembodied and embodied channels. The disembodied is where knowledge spreads through human mobility and research spill over; knowledge is tacit. The embodied is the process whereby knowledge is disseminated through the document and equipments; knowledge is explicit. This study adapted the embodied channel. Codifiability, availability, explicitness and teachability knowledge is an essential step in leveraging knowledge value in the university, and give permanence to knowledge. It represents or embeds knowledge in forms that can be shared, stored, combined, and manipulated in a variety of way [11].The problem is some of that knowledge has a human sense, other knowledge need a computer and machines.

This study describes the knowledge characteristics and explains its implications, in student performance epically that the university in the MIS department started to teach in theatrical forms, and technical ways, to transferring knowledge to student. In order to do this, it is necessary to identify knowledge characteristics; the four characteristics are used in this research described above (codify ability, explicitness and teach ability).

The model also helps to justify the four knowledge characteristics and it is effect on student performance, which can be used to improve a student's knowledge levels. The study going to answer the following questions:
-what are the knowledge characteristics?

- How availability, codify ability, explicitness and teach ability effect student performance? The study attempt to discuss by using questionnaire- based survey of student in applied science private universit in the following section, of study introduction, literature review, methodology -result, discussion and conclusion.

II. LITERATURE REVIEW

A. Tacit and explicit knowledge

People gain to create new knowledge from numerous activities. First, action-based learning that involves working on problems, and implementation of solutions. Second, systematic problem solving, which requires a mindset, disciplined in both reductionism and holistic thinking, attentive to details, and willing to push beyond the obvious to assess underlying causes. Third, learning from past experiences, is review a company's successes and failures, on order to take the way that will be of maximum benefit to the organization, as suggested by Morse [22]. Previously Nonaka and Konno [2]; and Seubert et al. [23] have classified KM into two primary states, namely tacit and explicit knowledge. These two states are discussed in the following.

B. Tacit knowledge

Tacit knowledge refers to the knowledge residing in the heads of people that is not codified. A person becomes aware of his or her tacit knowledge when faced with a situation or problem. This dynamic knowledge itself cannot be cataloged, although organizations can create catalogs better known as

directories or expert locators to label, and find people with mission-critical knowledge and experience [5]. However, tacit knowledge is resides in our minds and, cannot be easily shared or it is difficult to communicate with others, as defined by Seubert et al., [23];and Nonaka and Konno [2] add that tacit knowledge is deeply rooted in an individual's actions and experience, as well as in the ideals, values, or emotions he or she embraces. It has two dimensions: the first is the technical dimension, which encompasses the kind of informal personal skills or crafts often referred to as "know-how." The second is the cognitive dimension. It consists of beliefs, ideals, values, schemata, and mental models, which are deeply ingrained, in us and which we often take for granted. While it is difficult to articulate, this cognitive dimension of tacit knowledge shapes the way we perceive the world

C. Explicit knowledge

Only 20 percent of what an organization contains is explicit. Explicit knowledge is easier to document and share, contributes to efficiency, and easier to replicate. It comes in the form of books and documents, formulas, project reports, contracts, Process diagrams, lists of lessons learned, case studies, white papers, policy manuals, etc. [5].

Moreover, Wiig[18], Nonaka and Konno [2] and Seubert et al. [2] defined explicit knowledge as that which can be captured and expressed in words and numbers (i.e. quantitatively) and shared in the form of data by courses or books for self-reading, scientific formulae, specifications, manuals, and the like. This kind of knowledge can be readily transmitted between individuals formally and systematically.

However, Snowden [7] agrees with the above mentioned and he notes that, as its name suggests, it is easier to identify. It is reusable in a consistent and, repeatable manner. It may be stored as a written procedure in a manual or as a process in a computer system. The documented procedure of a lesson-learn workshop, the written-up comment of an economist examining a set of financial data, minutes of a meeting, a chain of e-mail correspondence, are all examples of explicit knowledge.

D. Knowledge Characteristics

Explicitness
Codifiability
Teachability
Knowledge Specificity

The organization's purpose can be fulfilled by adopting a wide variety explicit knowledge characteristic in student learning, such as virtual learning, the corporate university and self-directed learning [21].

E. Codifiability

The literature about knowledge codification, diffusion and application reveal some issues that need to be reviewed. Strategies that facilitate knowledge codification and diffusion are different[24]. The industry and the manager's perspectives toward his/her organization knowledge capability can determine this role. The industry difference is discussed under

knowledge management schools. A manager's perspective is discussed under the five knowledge enabler cycles. The four modes of knowledge conversion need to be specified in more detail when explaining knowledge flow in an organization. This gap is discussed within knowledge creation. Sharing knowledge is not direct implication of knowledge codification and diffusion. Knowledge can align long continuum explicitness, codifiability, teachability [5].

Seubert and Balaji [6] explore the organizational knowledge codification in their study. Codification is treated as a multidimensional construct. They focus on three different forms of codification. They can be aligned along a continuum of abstractness. Knowledge encoded in codes and figures are the most abstract form. Knowledge encoded in words and texts are less abstract form. Knowledge encoded in pictures and images are the least abstract form. They find that the effect of knowledge codification on organizational is moderated by a strategic context. Alavi et, al., [14] analyzed the variation of organizational capability to codify its knowledge based on two dimensions: Low-Volatility context and High-Volatility context within two industries; Product and Service-based industries. Low- Volatility context knowledge is less time-sensitive, and stored knowledge tends to be useful over along time span without updates. On the other hand, Knowledge in High-Volatility context is time sensitive. Stored knowledge needs to be refreshed continuously. Further, researchers define codification level in both Service and Product-based organizations in regards to Low-Volatility and High-Volatility contexts. The codification level is high in Service-based industries when Low-Volatility context. Whereas codification level is low in Service-based industry when High-Volatility context. In Product-based industry, codification is high when organizations are in a High-Volatility context [8]. The literature about knowledge codification, diffusion and application reveal some issues that need to be reviewed.

1-Strategies that facilitate knowledge codification and diffusion are different. The manager's perspectives toward his/her organization knowledge capability can determine this role.

2-The four modes of knowledge conversion need to be specified in more detail when explaining knowledge flow in an organization.

F. Knowledge Availability

The organization that has the ability to make knowledge available most effectively is more likely to survive than the organization that has less experience in making knowledge available (Argot et al, 2000). When knowledge is available there is better cooperation and communication throughout the organization, and the resulting financial performance and functioning of the organization improves (1999). Argot [17] warn that success in achieving knowledge availability is very difficult since most individuals are rejecting to share knowledge. However, Fernandez et al., [5] state that once knowledge is embedded into the work process the success of knowledge diffusion increases, as it will become a natural behaviors characteristic of the people.

There is an overall agreement that the primary role of an organization is not just acquiring and diffusing knowledge; it should be applied toward the production of goods and services and to affect the organization performance [15]. When knowledge is available to the whole organization, the focus is on the outcomes, such as productivity and profitability and high level of performance [16].

G. Knowledge Explicitness

There is a commonly held view that new knowledge always begins with an individual. For example, a smart investigator has an insight that leads to a new patent [13]. The explicitness support innovation, the individual or group that acts with organization knowledge can adds the necessary value in the organization, in order to support a commitment to innovation [19]. The necessary values that lead commitment to innovation and creation can be presented as two functions. Firstly, the human should talking, asking and triggering new questions and enquiries. Then encourage and help these people to transfer their ideas into something tangible.

Secondly, the explicitness knowledge helps to establish an enabling context for knowledge creation. Knowledge cannot be separate from its context. It is part of the physical, mental or virtual place where it was created. Where there are individuals in an organization who do not have the ability to articulate their knowledge in a formal way, the explicit knowledge should have the ability to convert to the tacit knowledge into the right context. This should connect with tacit knowledge in relating to an organization's culture. According to Szulanki [8], the ideal knowledge has a skill profile related to his or her ability to motivate skills, respect others, improve group dynamics and relationships; help the group to develop a charter of their tasks and responsibilities; develop a social network inside and outside the institution

H. Knowledge Teachability

Zander and Kogut [20] argue that instead of considering explicit and tacit knowledge, we should consider tow characteristics of knowledge –codifiability and teach ability. Teachability reflects the extent to which the knowledge can be taught to other people, through training, apprenticeship, and so on. Of course, some knowledge could be high in teachability [5]. As knowledge maturing is basically interconnection of individual learning process where knowledge is taught and learnt, an important criterion is its teachability. Whereas immature knowledge is hard to teach (even to experts), formal training allows by definition for wide-range dissemination [24].
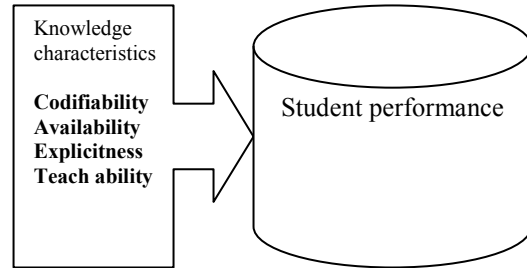
I. Student performance

According to Choen [15], the performance of an organization is positively affected by the ability of organization to assimilate and apply knowledge. Knowledge assimilation can also refer to an absorption capacity. In the theories of learning some took a narrow focus on teachers and learners in classroom sittings, others included reference to the characteristics of knowledge and it is influence on education

systems and even on society in general. Knowledge affects student's performance when it is available.

According to Havnes [11], the direct relationship between the attribute of knowledge and student performance is not always valid. Furthermore, according to them, these attributes is a measure of student knowledge. From the previous study we can see the relationship between knowledge characteristics and student performance. Therefore, knowledge characteristics are most likely to support the relationship between organizational performance and absorptive capacity [12].

III. RESEARCH MODEL

Figures 1
Source: Researcher

The research model depend in fours explicit knowledge characteristics from, Fernandez et al., [5]. They define the knowledge characteristic, namely populations of MIS student in applied sciences university. The researcher adapts the knowledge characteristics and develop questionnaire to investigate the relation between these characteristics and student performance from there points view.

A. Hypotheses

H1 - There is a significant positive effect between explicit knowledge characteristics and student performance in applied science university

H2 - There is a significant positive effect between codifiability and student performance in applied science university

H3- There is a significant positive effect between availability and student performance in applied science university

H4- There is a significant positive effect between explicitness and student performance in applied science university.

H5- There s a significant positive effect between teachability and student performance in applied Science University.

B. Research design

The term research design refers to the overall strategy of the research. Thus, the research design should advise us on how the sample will be drawn, what groups or

Research design is concerned with making our problems accessible by directing our research in away that generates precise answers to precise question. There are two approaches that the research methodology can be derived from these two

approaches can be classified into two main categories quantitative methodology, and qualitative methodology [9].

Sekaran [9] argues that variables and relationships are the central idea in quantitative research. This is the key objective in this research. Moreover, quantitative methods are very useful in explaining causality requires the establishment of relationships between variable, and linking them to a certain theory. The benefits of quantitative methods provide tools for measuring concepts, planning design stages, and for dealing with sampling issues, Therefore, quantitative approach are cost effective, and speed in data collection , the ease of analysis, apposite for testing hypotheses, and determining relationships between variables, and establishing the reliability of data [3].

Qualitative methods focus on generating hypotheses in order to illustrate, and explain the phenomenon in its context ,the benefits of the approach become visible by enabling researchers to examine change processes over time, and more in depth and offer rich, and distinctive insights. The criticism of the approach, arising from the fact that it the resource-intensive; analysis, and the interpretation of data is often complex and it requires distinctive skills, lack of well-formulated hypotheses [3]Considering the benefits, and the drawbacks of the two methodologies. In addition to the study limitations, which are discussed below .The researcher adopted the quantitative approach due to the following reasons.

1. Resource Limitation (time, and cost of the study)
2. The issues of validity and, reliability are often seriously questioned because of the nature of the data.
3. The need to satisfy the research objectives in terms of factor analysis, testing hypotheses.

C. Data collection methods

Collecting data and information resources
The data and the information will be gathered from two resources:

D. Primary resources

Individuals focus groups, and a panel of respondents set up by the researcher whose opinions may be sought on specific issues from time to time are examples of primary data sources [9].Data can also be culled from administrating questionnaire. Questionnaires are an efficient data collection mechanism when the researcher knows exactly what is required and how to measure the variable of interest [3].In this study the questionnaires send to populations of MIS student in applied sciences university.

E. Secondary resources:

Data can also be obtained from secondary sources , as for example company records or archives, industry analysis offered the media Web site, the internet and so on [9].Using the scientific (Books, articles, etc…) concerned with the study.

F. Questionnaire design

The questionnaire development process was guided by the following practices:
Initial design, is development of the survey instrument.
Pre-testing, is enhancement through panel of expert's opinion.

G. Initial design and development of the survey instrument

Many criteria should be considered when designing a questionnaire survey[9].On the choice of wording, questionnaire design, and layout were adopted .Items in questionnaire were designed to being simple ,clear , short ,technical, accurate ,bias free, and at an appropriate reading level [9][3] were taken into account when designing the questionnaire, such as started with a brief description on how to answer the questionnaire .An initial draft of questionnaire was developed based on an extensive literature review, and existing measures .

H. Data analysis procedure

The analysis will be conducted in two stages: instrument validation and hypotheses testing. Statistical techniques will mainly be employed in order to examine the hypotheses. The means and percentages were used to examine the knowledge characteristics as independent variables on student performance in applied science university.

I. Sample size determination

Based on the work of the determination of sample size took into account the following:
-What alpha level could be used in the formula?
-What is the acceptable margin of error in the formula?
The dependants are explicitness, codifiability, teachability, and availability. The student's performance is the independent variables play a major role in this research. Absorptive capacities are all based on the five point Likert scales [3].

J. Decisions related to population and sample selections

The unit of the analysis in this study is the MIS student in the applied sciences university 400 Questionnaires were sent to 400 populations of MIS student in applied sciences university. Were 378 returned, 7 Questionnaires were ignored because it has missed? The overall response rate for this study is 85 %. The response rate actually used is 82 %. This is regarded as relatively high, since the respondents are managers supposed to be too busy to answer questionnaires. Because the achieved responding

Sample was 371, the standard error in the analysis will be207250 = 1, 12 However, it is found that sample is sufficient to represent the regression analysis conducted.

K. Operationalisation and measurement strategy of the model variables

The measures of model variables in this were operatinalise using statistical procedures starting with internal consistency test , establishing constructs reliability, statistical procedures are common among many researchers, such as [1]; [3].

1- Internal consistency to assess the reliability of the scale using Combach's alpha.

2- Developing a structural model based on the composite measures to linking the hypothesized model's constructs.

3- The means and percentages of each item in the questionnaire were determining the knowledge characteristics on the student performance.

L.   Internal reliability

The internal consistency measures (Combach's Alpha) are obtained in order to assess the reliability of the measurement instruments. The following table shows the Combach's Alpha value for each scale. It is clear that Cronbach, s alpha is valid, acceptable statistically and managerially because (α) values are greater than accepted percent 0.60.

Table 1 Reliability analysis

No	Variables	Cronbach's alpha(α)
1	Codifiability	0.86
2	availability	0.84
3	explicitness	0.75
4	teachability	0.74
5	Students' performance	0.83

IV.   RESULTS

The questionnaires contained twenty -five statements divided into five dimensions the first dimension consisted three statement that were related to codifiability, the second consisted of eight statements related to the availability, the third consisted of five Statement related to the knowledge explicitness and, sixth statement related to knowledge teach ability finally four statement related to student performance.

Table2 Knowledge Codifiability

N	Item	mean	percentages
1	Represents a knowledge in numbers and codes	2.5	50%
2	Represents a knowledge in words and text	3.0	60%
3	Represents a knowledge in pictures and images	3.40	80.4%

Table 2 shows that 60% of the student's belief that the university represents the knowledge in a word and text.80.4% of the research sample think that the knowledge represents in picture and image. In the other hand 50% belief that knowledge represent in a codes.

Table3 Knowledge Availability

N	Item	Mean	Percentages
1	Knowledge helps the students to know their duties and tasks		
2	Knowledge helps the students to know how to act in different situation	2.2	44%
3	Knowledge helps the students to recognize the gap between their expected and their actual performance	1.8	34%
4	Knowledge helps the students to close the gap and learn from mistakes	1.68	32.6%
5	Knowledge helps students to realize the impact on their performance.	4	80%
6	Knowledge helps to set infrastructure to the topics.	4.25	85%
8	Knowledge helps to assess and reviewed proposed new assignments	4	80%

Table 3 shows that 85% of the research sample agree the university knowledge helps the students to accomplish their duties, and to set infrastructure to the topics. In the other hand Learn from mistakes, and recognizing the gap between the expected and actual performance have the lowest percentage.

Table 4 Knowledge Explicitness

N	Item	Mean	Percentages
1	Knowledge that is obtained is captured and/or documented.	4.49	79.9%
2	Prof is captured and/or documented past knowledge	4.5	90%
3	Students are encouraged to get on assignment on how to capture/document what they are learning	3.93	78.7%
4	There is an incentive to document relevant technology and economic issues	2.33	46.7%
5	Students are able to acquire knowledge using the latest technology	3.37	67.6%

The result of table 4 shows that 90%of students belief that captured past knowledge. The lowest levels were to the technology and economic issues.

Table 5 knowledge Teach ability

N0.	Item	Mean	Percentages
1	Uses knowledge to improve student's performance	3.7	63%
2	Makes knowledge accessible to students quickly	3.4	69%
3	Takes and assignment **t**ransfer and helps in create new knowledge	3.5	30%
4	Takes and assignment transfer and helps in create new knowledge	4.05	81%
5	Quickly applies knowledge to computer application	2.95	59.1%
6	we use case study to learn how to solving problems and to support student knowledge	3.33	66.7%

The result of the table 5 show that question number 4 has the highest level it equal 81% percentages. The lowest percentages equal 59.1% was to applied knowledge application

Table 6 Students' performance

N0.	Item	Mean	Percentages
1	The new way of capture knowledge Students are more successful	3.25	65%
2	Knowledge in the university make Student have great marks	2.64	42.68%
3	Knowledge in the university make Students have a faster improved rate	3.26	65.2%
4	Knowledge in the university make Students are more innovative	3.25	65%

The results of table 6 show that the students agree that the new form of Knowledge helps them to success and to faster improvement rate.

Table 7 Summary of research hypotheses

Hypothesis	Beta	t-value
H1 The relationships between student the KC and Student performance	.198	3.176
H2 The relationships between student the KC and performance	.284	5.066
H3 Knowledge Availability and Student performance	.391	7.265
H4 Knowledge Explicitness and Student performance	.373	7.056
H5 Knowledge Explicitness and Student performance	.125	2.176

Based on the results in table (7) which relate to hypotheses testing we can find a positive and significant effect at function level ($\alpha \leq 0.01$), which supports hypothesis between the independent variable and the dependent variable which supports hypothesis (Ha1.Ha2, Ha3, Ha4, Ha5

V. DISCUSSION

The result shows that there is high homogenous responses of statistical sample at statistical function (α=0.0 l). Throughout this survey it was found that knowledge characteristics are important to the student performance. Codifiability knowledge effect student performance but not all types of knowledge can be codifying some kind of knowledge can be articulated, represent the tasks and the way of doing that knowledge. In addition explicitness has the greater effect on student performance because in Jordan they focus in classifying explicit knowledge more than tacit, in general [8] argue that explicit and tacit knowledge kinds of knowledge at the tow end of a continuum. Explicit knowledge high in explicitness and tacit knowledge low. In other hand Knowledge teachability has second stage; some knowledge could be high in teach ability, however many assignments given to student and case study. In the other hand some knowledge could be low teachability like fix problem in computer, adding the advance technology, or documented the new issues. According to knowledge availability what we have seen that there is allot of focus in explicit knowledge and low attention for tacit knowledge because there's a shorter in application that support the activity regard to solve problem or to learn from mistakes, the researcher justifying that because of the university did not reviewing the tools and software that useful for storing and sharing explicit and tacit knowledge. Finally Students' performance, most of student agreed that there performance in middle level not in a high level .The researcher justifying that because of computer-mediated possibilities limitation, some of these limitation related to the acquisition, storing and, transferring knowledge. The researcher argues that student's knowledge still needs supportive tools.

VI. CONCLUSION

In this study the researcher introduced a new model for thinking about the knowledge characteristics and its effects in student's performance. The researcher argue that the university should identifying the knowledge characteristics because these characteristics help to fix student problems related to classifying, documenting, and acquiring knowledge . Knowledge characteristics facilitate the process of storing and sharing knowledge. The primary role of a university is not just acquiring and diffusing knowledge; but to applied the knowledge in away effect the student performance. The researcher remains to more understand to knowledge characteristics and the potential techniques that support reflects the extent of which knowledge can be articulated or which knowledge can be taught to other individuals, through training, practices or apprenticeship

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