

Measuring Knowledge for Visual Basic's Student

by

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(Information System)

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- 1) Mensuration
- 2) Uncertainty (Information theory)
- 3) Knowledge Theory of
- 4) IT IS - Thesis

CERTIFICATION OF APPROVAL

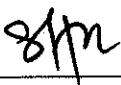
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A project dissertation submitted to the
Information System Programme
Universiti Teknologi PETRONAS
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Approved:



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UNIVERSITI TEKNOLOGI PETRONAS
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June 2005

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.



SHARIFAH NURHASNIDA BINTI SYED HASHIM

ABSTRACT

Knowledge is so valuable and that's why it is significant to find a measurement in measuring the knowledge, so the value of knowledge been gain can be amounted and easy to describe. As much research been done in measuring knowledge field, especially the organization knowledge, this project objective is to find out student knowledge performance and activities through a forum in order to find what characteristics required in creating technique of measuring student knowledge for Visual Basic's student. In completing this project, the methodology that been used is quite similar to a Waterfall Model, but some part have been changes to suit the timeline and information been gather. The findings from this study highlight an appropriate metrics used to get result in measuring student knowledge in Visual Basic by using Brand Equity and Probability as indicators in measuring. The final result in this measuring technique is valued between 0 until 1.

ACKNOWLEDGEMENT

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

Knowledge is to try to understand what is unknown, and nowadays knowledge is so valuable to people especially to organizations as they realize that knowledge is a strategic resources that gives them sustainable competitive advantage. Not only in business field but due to profound changes in competition have made universities and higher education institutions think like business. Due to this, knowledge become valuable and people try to manage knowledge.

Knowledge and skills are acquired not just through formal education but also, and increasingly, through formal and informal learning outside regular educational programs. No matter where the knowledge been gain, this project mainly to create a technique in measuring student knowledge in Visual Basic as it review how well the education systems meet core objective in learning Visual Basic.

This project used a forum as the medium or driver in measuring knowledge and the forum will capture all activities in it. From the forum scenarios, it will illustrate activities from the student and it will be acknowledged as characteristics and it describes how the student used their knowledge. Later the knowledge been deposited into the system then the knowledge will be measured using Brand Equity and Probability as the indicators

Hopefully this measuring technique will motivate students to learn and understand better in studying the subject as it gives benefit to the educational institution.

1.2 Problem Statement

1.2.1 Problem Identification

- In order to measure knowledge, it is essential to ensure participation by student into the forum as their knowledge been recognized as the most important characteristics of this project.
- There is no standard yet in measuring student knowledge through a forum in an education field. Besides the traditional methods, such as; quiz, test, assignment, tutorial, project and final exam. This measuring technique will be one of the methods to evaluate student knowledge just through a forum.
- As the technology expanding from time to time, by taking chances on it through the forum as a medium in measuring, it also provide functionality to support knowledge sharing and collaboration between students where they can exchange information, share knowledge and guide each other in learning the subject.

1.2.2 Significant of the Project

- This project is significant as it describe some techniques in measuring student knowledge that are valuable for educational institution as it describe student performance in learning; in this case Visual Basic been taken as a case study.
- By creating the metrics, it becomes understandable and easier to value student knowledge.

1.3 Objectives

Objectives for this project are:

- To discover student performance and activities through a forum in order to find out what characteristics required in creating technique of measuring student knowledge for Visual Basic's student.
- To develop a measuring technique based on characteristics been discover.

1.3.1 The Relevancy of the Project

This project is relevant due to a research been done and comparison with others knowledge measurement system been created before by organizations that are linked to achievement of real business results.

With a participation from student in the forum, knowledge been deposited into system and it add value though information sharing and knowledge acquisition as it benefits students by participate in it. Learning will become more effective and students will have chances to apply their knowledge to the best way it should be. Meanings, the student have ideas to use what the best methods from their point of view to be applied in any circumstances that required them to do something. Example; the student will have a choice to use either horizontal scroll bar or vertical scroll bar.

1.3.2 Feasibility of the Project within the Scope & Time Frame

This project is feasible because the student can easily access the knowledge resources that available in the forum, and students can spend time in value-addition and addressing specific problem in Visual Basic rather than reinventing what has already been done earlier. Student's activities in the forum are important as it represent the process in measuring the knowledge repositories of the forum users.

CHAPTER 2

LITERATURE REVIEW

2.1 Knowledge Measurement

According to one online dictionary; thefreedictionary.com [14], the definition of measuring system is an *instrument that shows the extent or amount or quantity or degree of something*; for an example, algometer is a device for measuring pain caused by pressure. And according to the web also, the definition of knowledge is *information as to a fact*. When it comes to this project, Measuring Knowledge for Visual Basic's Student, it will give a meaning as an instrument that shows the degree and level of information.

Knowledge measurement is a good example of a new branch in the field of strategic management [1], due to the increased relevance of intangible resources and knowledge in particular, for sustainable differentiation had led to an explosion of new publications on knowledge and also knowledge management.

No matter what, measuring knowledge systematically supports better decisions about human capital, and signals how knowledge is valued [2], and this is why this Measuring Knowledge technique try to measure and valued student knowledge that deposited in the system through the forum.

Furthermore, according to Nick Bontis, basically there is no shortage of knowledge measures that propose to measure intellectual capital, knowledge or learning [3].

Paul and John [4] in their book state that it is almost axiomatic in management that what you cannot measure you cannot manage, but today as knowledge are so valuable people trying to manage it and it makes point by that knowledge perhaps can be measure.

Three aspects of the measurement and evaluation of knowledge management programs from Paul and John [4] are; first, it is possible to develop metrics. Second, they are not very precise; they are highly contextual and depend very much on their value to the individual. Third, they are to some extent necessary.

2.2 Types of Measurement

In discussing about types of measurement, lets take a look at the traditional accounting and financial measures first, as it have endured centuries of use and change from time after time because investors, management, customers and regulators always need for knowledge metrics that are reliable and acceptable across the world.

Also, traditional accounting techniques have found it easy to count dollars, as if that calculation alone proved valuable as a predictor of company fortunes [5]. For classical example in metrical measurement are temperature in degrees Celsius, and length in centimeters, which in knowledge management measurement, these formulate are been select so it could be prove useful in measuring and influencing knowledge management performance [9].

2.3 Knowledge Toolbox

In research done by Nick Bontis [3], he listed four tool of the knowledge toolbox; first HRA (Human resource Accounting); that have advantages as it calculated in financial terms but resulting too many assumption that some of them which cannot hold and also it is too subjective.

Second, Economic Value Added (EVA); which correlates well with stock price but have a complicated adjustment procedures.

Third, Balanced Scorecard (BSC), a well-develop and consistent literature but inappropriate consideration of human assets and knowledge creation processes.

And lastly, Intellectual Capital (IC), more flexible and applicable to not-for-profit organizations but have a confusing literature also the metric development is still at early stages. According to Thomas and Arthur [5], without knowledge metrics, knowledge will be hoarded by organizations as a scarce resource. By that, knowledge metrics must be based on quantifiable, real-world-based raw data that can be rigorously and adequately captured in a common unit of measurement.

2.4 Characteristics in Measuring Knowledge

In business form, R. Eccles [6] has point out some measurement tools such as; quality, customer satisfaction, innovation, market share and others, which metrics like these often reflect a company's economic condition and growth prospects instead of mere financial evaluation.

He also stated that every company will have its own key measures and distinctive process for implementing a new technologies change, with a careful preparation and perseverance.

Knowledge Management Value Assessment Framework or KVA indicate that the key to measuring a value is to first determine the indicators of behavior (to be measured) that would influence the generation of measurable value (work measures) [7]. It also mentioned that management and measurement are tied. If measurement does not make management better, there is no need for it. Therefore, measurement must reflect the goals and objectives of the business. In essence, knowledge management metrics are about how the organization manages its resources to achieve its goals.

Arun Hariharan states that, it is more important to have a set of measures that directly related to achievement of business result [8].

AQIP performance measures been viewed at least annually to determine whether progress is being made on the Action Project [10]. From educational research done by D.R. Newman, Brian Webb and Clive Cochrane [11], they know that learners can adopt deep or surface learning approaches.

Surface learning approaches include skimming, memorizing, and regurgitating for tests, whereas deep learning requires a critical understanding of material. It can be said that deep learning is promoted by active learner participation and based on this project with an interaction of the system affective involvement from the student can be gain.

Much of the innovation is designed to align assessment tasks more closely with the processes of problem-solving in the workplace (access to resources and colleagues) in the belief that traditional examinations may not resemble the work and life situations in which students use their knowledge and skills [12].

Meaning, that traditional method such as test, assignment and quiz mainly did not be similar to the right aspect needed for real situation that the student's knowledge needs to be applied.

From time to time there is new attention to develop a creative way to measure student learning and knowledge and with the new technological possibilities, there are a major source of innovation, with universities actively exploring the potential of computer-based assessment to assess learning and provide students with rapid and informative feedback [12]. For example, incentive from Australian Universities Teaching Committee (AUTC) in Assessing Learning in Australian Universities

In measuring student reading proficiencies article by Joseph and June [13], it were stated that in turn to measure whether knowledge mapping would help predict whether the student would ask for help, they have to examined every word the student encountered and noted whether he asked for help or not.

CHAPTER 3

METHODOLOGY

The project will take seven (7) months starting from January 2005 until Jun 2005, based on phases in the methodology. To be more specific, this project basically will face three phases to complete.

This section of the report describes the methodology that was used in completing the project. Based on the linear sequential model or waterfall model, this model is slightly modified to suit the project.

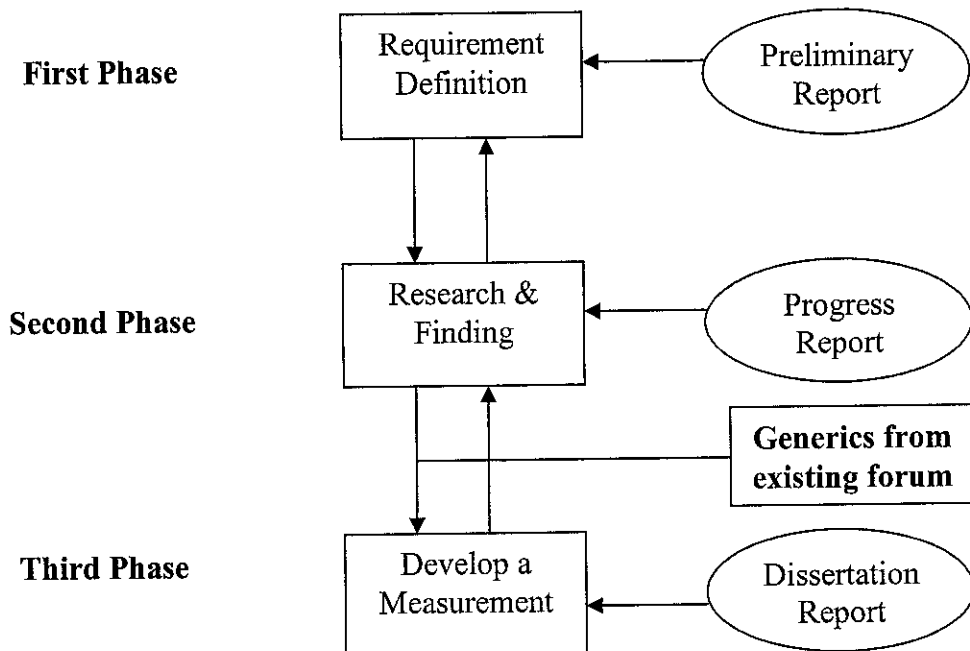


Figure 1: Project Framework

The framework have been chosen as a methodology because of this model is well-defined, cascade from one phase to another and in principle, the following phase should not start until the previous phase finished. In practice, these stages overlap and feed information to each other.

3.1 Procedure Identification

3.1.1 First Phase

Requirement Definition is a first phase where the requirement in completing this project been gathered from the supervisor. The important part in this phase is to get a clear view in what aspects and condition the project is all about, and after obtaining necessary aspects; the results in this requirement definition phase is creating and do a research in creating the best measuring knowledge techniques that include relevant metrics and focus group. To make it more clear, this project specific scope is the student learning Visual Basic which the subject will be the knowledge that need to be measured.

3.1.2 Second Phase

After establish a mutual understanding on the objective of the project, **Research & Finding** is the next phase; In this phase, a lot of studies been done in order to gain information about how exactly knowledge been measured. A forum will be a medium or driver in measuring the student knowledge and from generic the flow and scenario in the forum, student's activities and characteristics will describe the knowledge performance by the student. And the important part in this phase is about how to measure knowledge based on the knowledge been deposited into the system through the forum.

3.1.3 Third Phase

To create the measurement is the key in completing this project, and this last phase; **Develop a Measurement**, need all information in second phase and divided it more specific into focus group where the focus group will categorize the characteristics from student activities in the forum. By using indicators, then the results of measurement will become a critical success factors for knowledge measuring as long it relevant to all activities from the students.

CHAPTER 4

RESULTS & DISCUSSION

In this chapter, as it vitally needs so much research and finding, it comes out with a result that will be the best for the reason why and what aspects that effect the decision of choosing the best measuring techniques for the system.

4.1 Knowledge Classification

There are several classifications the type of knowledge and some that related to this project is listed below:

4.1.1 Tacit & Explicit Knowledge

Tacit knowledge is knowledge that cannot easily be put into words. It takes time and considerable investment to develop. In other words, it is knowledge that resides within the heads and motor neuron systems of students and has not been codified or made explicit. Tacit knowledge is highly personal and hard to formalize. Subjective insights, intuitions and hunches fall into this category of knowledge.

Explicit knowledge is knowledge that has been codified into words and so easy to transfer, it also greater value when widely applied, but it also leaks to others because it is easy to transfer. This type of knowledge also can be express in formal and systematic language and shared in the form of data, scientific formulae, specifications, and manuals and others. In other words, explicit knowledge can be process, transmit and store relatively easily.

Both types of knowledge are essential to knowledge creation. Explicit knowledge without tacit insight quickly loses its meaning. Knowledge is created through interactions between tacit and explicit knowledge, rather than from tacit or explicit knowledge alone.

4.1.2 Know how, know what, know why, know when, know who.

It is a fact that when doing anything, knowledge about what the right course of action been draw and then apply knowledge about how to pursue that course of action.

- Justified true belief – ‘know what’ or ‘know that’ which provided the raw material for deciding what to do and includes facts, assumptions and values.
- The capacity to act – ‘know how’ derived from resources such as procedures, rules, practical experiences, mental and physical abilities. This is the knowledge base that we draw on to show us how to take action.

4.2 Process in Measuring

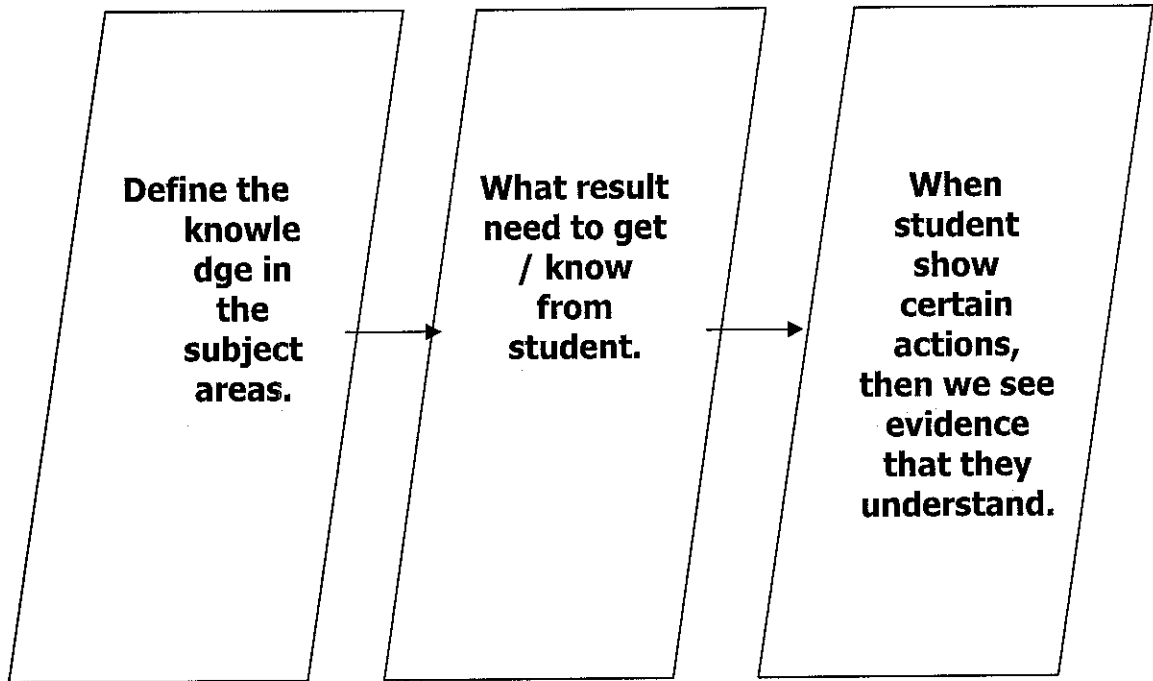
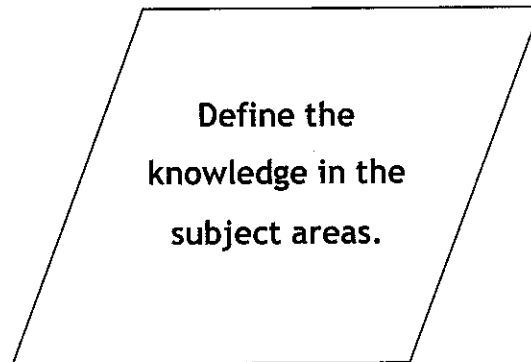


Figure 2: Process in Measuring

Figure above illustrate step by step process include in creating a technique in measuring knowledge. It describes and simplifies what elements and aspects need to be taken into consideration while coming into the final action in applying indicator to measure knowledge.

4.2.1



Step 1: Firstly, in order to capture the knowledge that need to be measuring, the knowledge itself define what areas and subject that covered it. It is important as it provides clear views on what information and characteristics that taken into consideration as knowledge in this project.

Knowledge is dynamic since it is created in social interactions amongst individuals and organizations. Also knowledge is context-specific, as it depends on particular time and space. Without being put into a context, it is not called knowledge, it is just information. For example: 'TextBox', is just information. It can be conclude that without context, it does not mean anything and if then the information been put into a context it becomes knowledge; 'TextBox can be use for user input; (Text1.Text = "Click Here")'.

But in some circumstances, perhaps student gain an extra knowledge from others resources such as; book from library, sources from an internet, learning by themselves or sharing knowledge from each other. This matter same as referring in the previous discussion in Tacit & Explicit Knowledge.

4.2.1.1 Knowledge Value

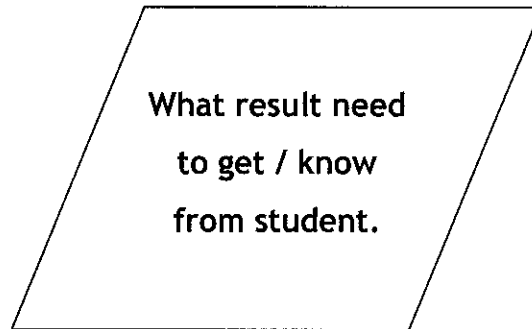
In a situation such as when one student transfers knowledge to another student, the result affects both students that now have access to that knowledge. The process the giver uses to access their knowledge may give a result for seeing the subject from a new perspective, as well as allowing the receiver to combine the new knowledge with that gained from previous experience to generate a completely new insight. Any form of measurement must recognize the particular characteristics of knowledge, such as:

- **Subjectivity.** Knowledge has nothing more than potential value until it is put to use in a way that it been recognizes as valuable. As for student the knowledge in Visual Basic Programming is so valuable for their final exam paper in Visual Basic Course. Assessing how potential will translate into realized value is largely a subjective judgment.
- **Comparability.** Comparing the relative weighting of knowledge contribution that is measured on different scales can be difficult. Each University will have different views on what subject's area in Visual Basic is important and what should be measured.

The basic difficulties associated with measuring the value of knowledge are:

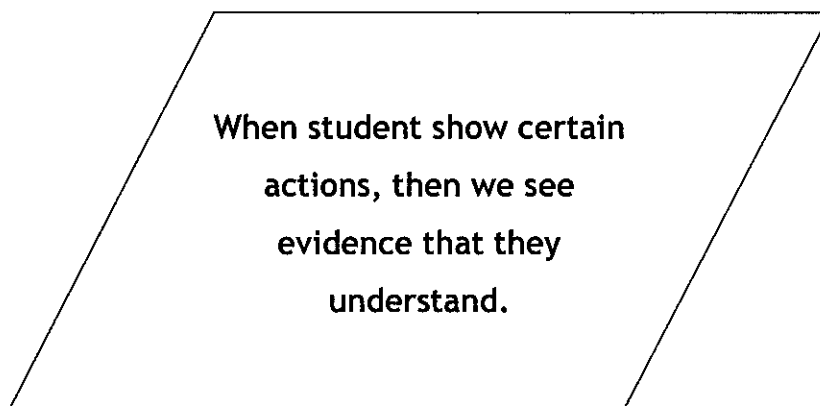
- Often student do not know what they know and even when they do, they often undervalue it.
- Knowledge has the greatest value creating potential when combined with other knowledge. Example; using Command Button in displaying Message Box.
- The same knowledge asset can generate value in many different ways depending on how it is associated with other knowledge. Here, it can be said that knowledge in Visual Basic can be applied in Visual Basic.Net also.

4.2.2



Step 2: Second step in the measuring process is to find out exactly what result that need to get and know from student. Briefly, it describe that what the main point that been looking from student that will be used as an output from the measuring process.

4.2.3



Step 3: An explanation for this statement is, when student give a feedback or any activities through the system, then it shows the student understand based they want to participate in it. Students have chances to implement all knowledge they got from learning into practice. Student basically respond based on their knowledge in Visual Basic Programming and they might want to participate in order to show that they have something to shared and discussed regarding it. With all this, the knowledge flows and the flow will create a value.

4.3 Measuring Indicators

After some research and studies on some example of successful measuring knowledge techniques, although most of them is about organization and business field, I have come out with one best indicators that suitable to apply in this project; Brand Equity.

Another indicator that applied in this project is taken from one of research methods for business; Probability.

So, as the conclusion in finding measuring indicators for this project; Measuring Knowledge for Visual Basic's Student; Brand Equity and Probability been choose and be the best combination.

4.3.1 Brand Equity

In measuring Brand Equity, one common method used is by using panel data to generate a measure of loyalty. It then has been the concept of 'Share of Category Requirements' (SCR) or 'Share of Requirement' (SOR) using by Nescafe to expresses as a share of all instant coffee bought by respondents who bought Nescafe during the analysis period.

On this basis, the more loyal customer is the one for whom the brand represents a higher share of category requirements; for instance, someone who buys seven jars of Nescafe on then purchasing occasions is more 'loyal' than someone who buys only three.

An alternative to SOR as a way of defining loyalty is to look at patterns of purchasing over time, and use this to estimate the probability of each panel number buying the brand on the next purchase occasion. Alain Pioche of Nielsen, has describes and illustrates how it can be more sensitive than SOR by using:

1 = a purchase of the brand

0 = purchase of another brand

In this project, the Brand Equity been taken as an example and guideline in measuring student knowledge because it more simple and easy to analyze as it indicate the value to be measured as 1 or 0.

4.3.2 Probability

Why Using Probability?

Probability is a measure of the likelihood that an event or the collection of one or more outcomes of an observation of some activity or the act of taking some measurement happen and occur.

Probability can only assume value between **0** and **1**.

A value near **0** means the events is not likely to happen, and a value near **1** it is likely to happen.

When applied to this project value **0** to **1** means the rate of knowledge measurement success shows. When the result near **0**, it describe that the knowledge focus areas is not quite strong in measuring knowledge and when result near **1**, means the knowledge focus areas is important part in measuring knowledge.

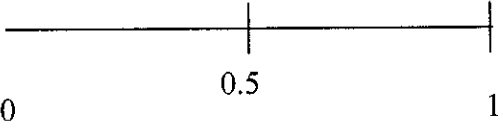
Brand Equity	Probability
<ul style="list-style-type: none"> ■ = Yes & 0 = No ■ These explain that in each category in focus areas, the results come out will be either 1 or 0. 	<ul style="list-style-type: none"> ■ Probability can only assume value between 0 and 1. A value near 0 means the events is not likely to happen, and a value near 1 it is likely to happen. ■ When applied to this project value 0 to 1 means the success weight of the knowledge. ■ <div style="text-align: center; margin-top: 10px;">  <p>A horizontal line representing a scale from 0 to 1. There are vertical tick marks at 0, 0.5, and 1. The number 0 is below the left tick, 0.5 is below the middle tick, and 1 is below the right tick.</p> </div>

Figure 3: Brand Equity & Probability

4.4 Knowledge Creation Process

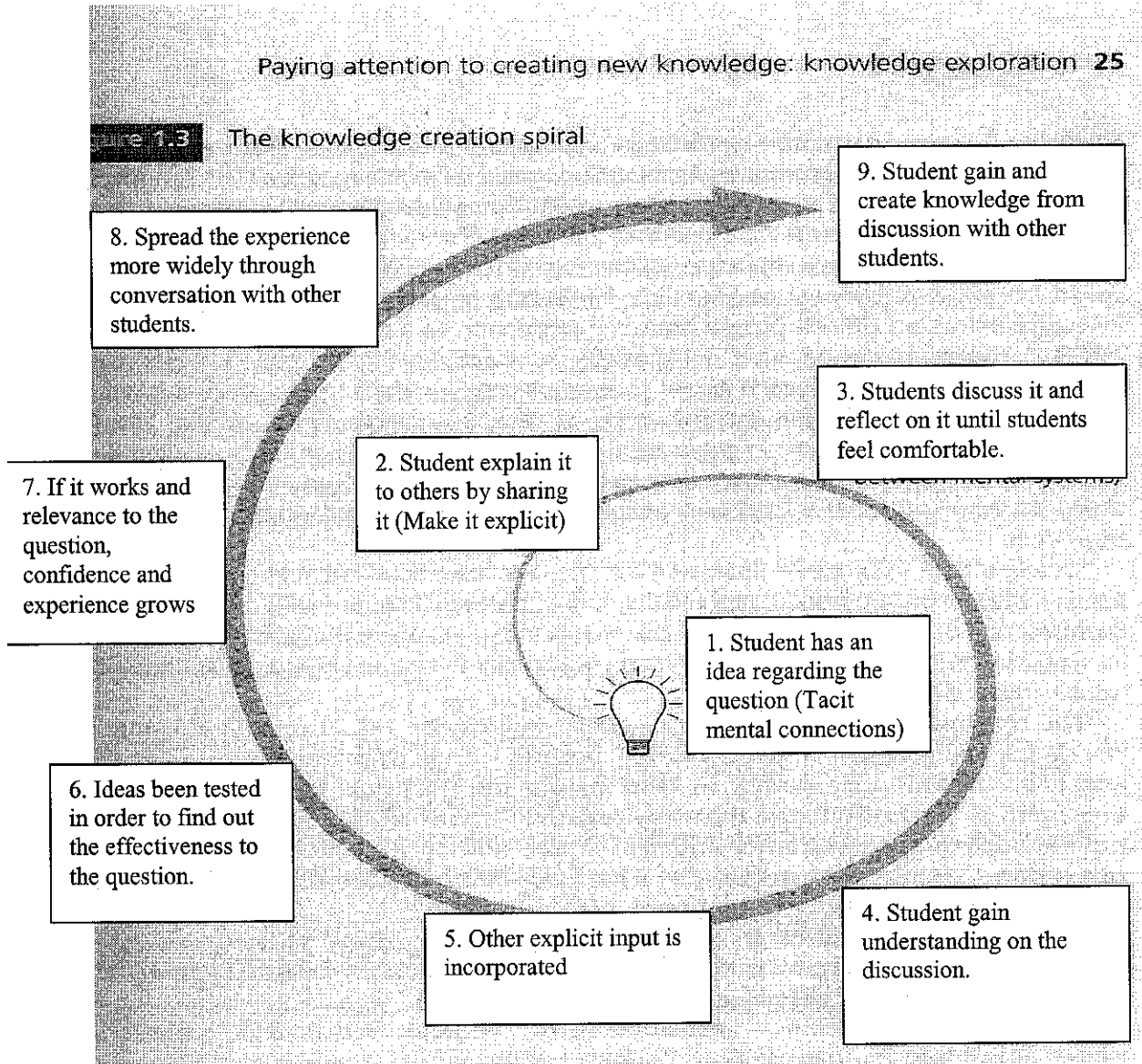


Figure 4: The Knowledge Creation Spiral

4.5 Measuring Metrics

A metrics that used in measuring student knowledge in Visual Basic Programming is depending on the forum activities; hence the forum just functions as a driver in creating a technique in measuring the student knowledge.

From the flow of student activities in the forum, 14 best characteristics has been discover:

1. Student participates in the forum and gain new knowledge value
2. Student adopt deep learning
3. Student adopt surface learning
4. Student ask for help in same problem
5. Student ask for help in different problem
6. Student post solution for problem question
7. Student participates in problem solving in same problem
8. Student participates in problem solving in same problem after viewing others solution.
9. Student participate in problem solving in different problem
10. Student participates in problem solving in different problem after viewing others solution.
11. Student view others opinion in same problem
12. Student view others opinion in different problem
13. Student get feedback from others
14. Student own interest in choosing opinion for problem solving

Using these 14 characteristics, the characteristics will be grouped in certain knowledge focus areas based on the best assumption

4.6 Focus Areas

In this project, 5 focus areas been identified based on the types of knowledge management.

- Knowledge Capture
- Knowledge Codification
- Knowledge Sharing
- Knowledge Transfer
- Knowledge Innovation

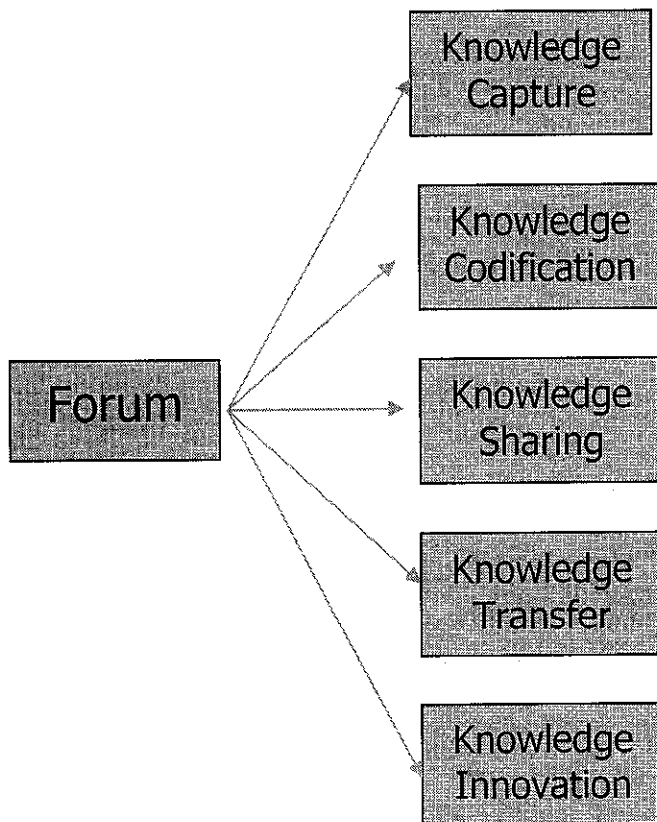


Figure 5: Forum's Focus Areas

Now, the previous 14 characteristics then been divided and grouped into each focus areas based on the best assumption and suitability.

<p style="text-align: center;">KNOWLEDGE CAPTURE</p>	<ul style="list-style-type: none"> • Student ask for help in same problem • Student ask for help in different problem • Student post solution for problem question
<p style="text-align: center;">KNOWLEDGE CODIFICATION</p>	<ul style="list-style-type: none"> • Student adopt deep learning • Student adopt surface learning • Student own interest in choosing opinion for problem solving
<p style="text-align: center;">KNOWLEDGE SHARING</p>	<ul style="list-style-type: none"> • Student participates in problem solving in same problem • Student participate in problem solving in different problem • Student get feedback from others

<p style="text-align: center;">KNOWLEDGE TRANSFER</p>	<ul style="list-style-type: none"> • Student participates in the forum and gain new knowledge value • Student view others opinion in same problem • Student view others opinion in different problem
<p style="text-align: center;">KNOWLEDGE INNOVATION</p>	<ul style="list-style-type: none"> • Student participates in problem solving in same problem after viewing others solution. • Student participates in problem solving in different problem after viewing others solution

After categorized the focus areas, this project then go on to next level by applying measuring indicators; Brand Equity & Probability.

Tree Diagram

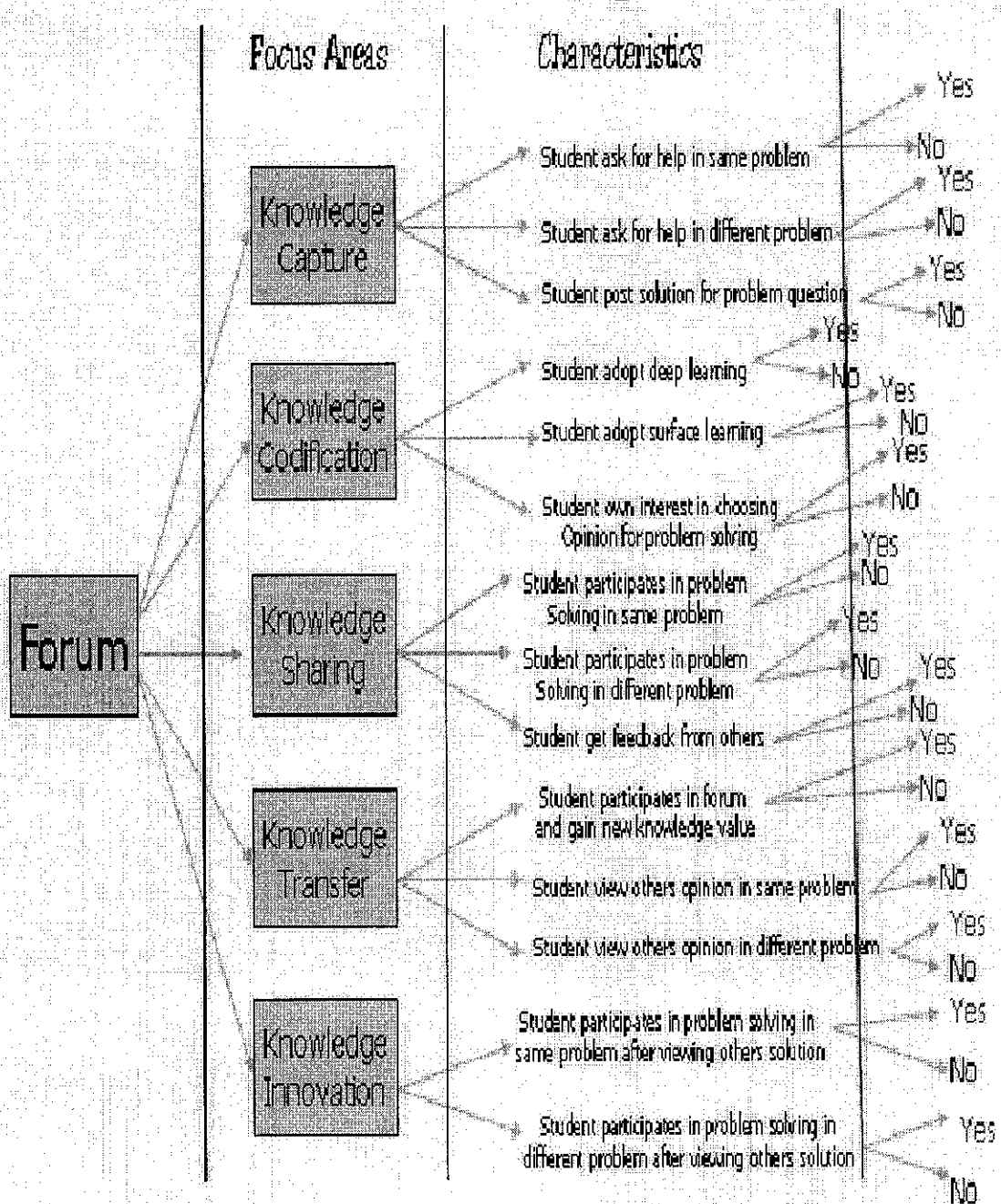


Figure 6: Tree Diagram

4.7 How to Measure?

In showing how to measure the knowledge based on the characteristics in the focus areas been created, firstly this measurement used the Brand Equity indicator:

1 = Yes

0 = No

These explain that in each category in focus areas, the results come out will be either 1 or 0.

Example:

To measure student knowledge in knowledge transfer focus areas.

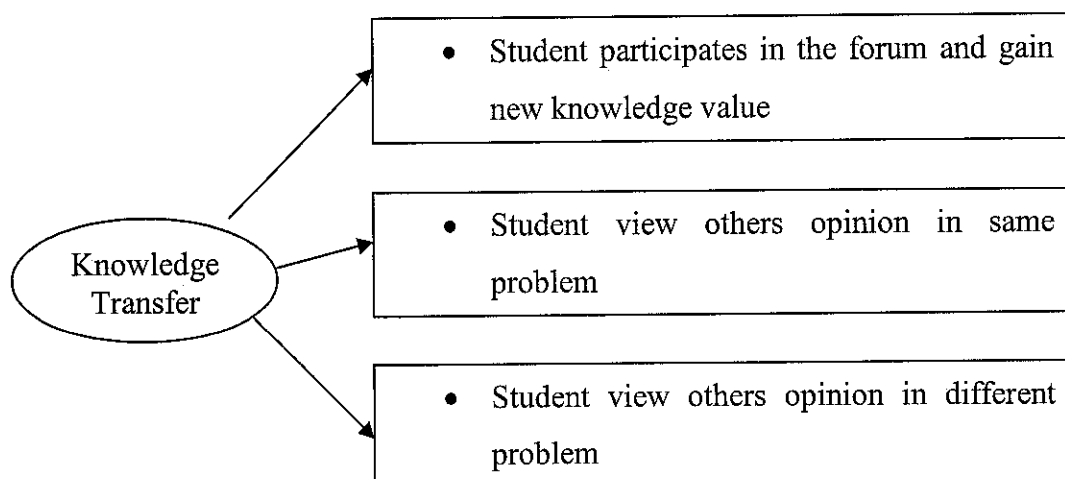


Figure 7: Knowledge Transfer Focus Area.

- ✘ Knowledge Transfer divided into 3 characteristics:
- ✘ Based on Brand Equity indicator, value **1** and **0** been used and applied, it give value to each characteristics based on the student activities in the forum.
- ✘ As for an example:

FIRST ASSUMPTION

→ Student participates in the forum and gain new knowledge value

Assuming = YES = 1

→ Student view others opinion in same problem

Assuming = YES = 1

→ Student view others opinion in different problem

Assuming = YES = 1

Then used second indicator, Probability;

So Probability = **3 YES / 3 characteristics = 1**

Knowledge Transfer has 1 probability in successful.

SECOND ASSUMPTION

→ Student participates in the forum and gain new knowledge value

Assuming = YES = 1

→ Student view others opinion in same problem

Assuming = NO = 0

→ Student view others opinion in different problem

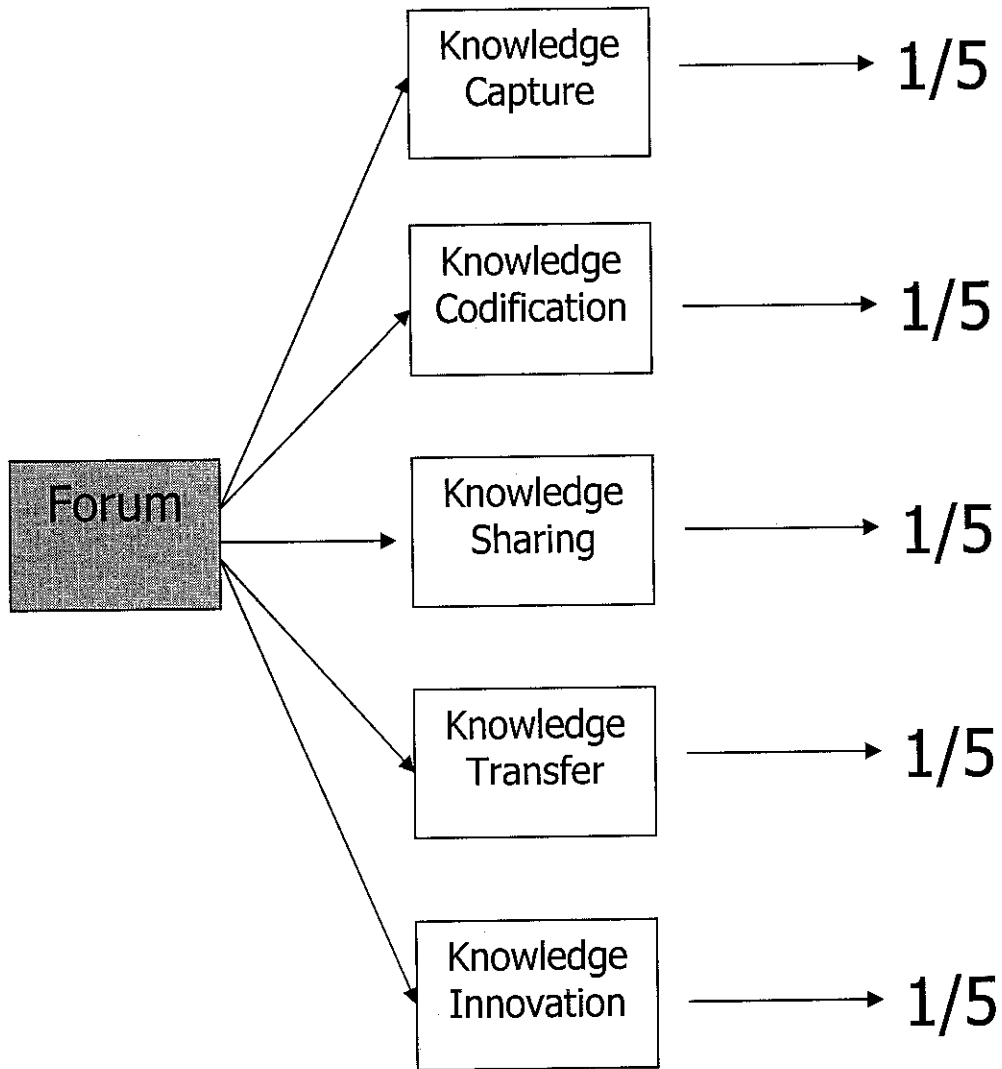
Assuming = NO = 0

Then used second indicator, Probability;

So **1 YES / 3 characteristics = 0.333**

Knowledge Transfer has 0.333 probabilities in successful.

4.8 Applying Probability

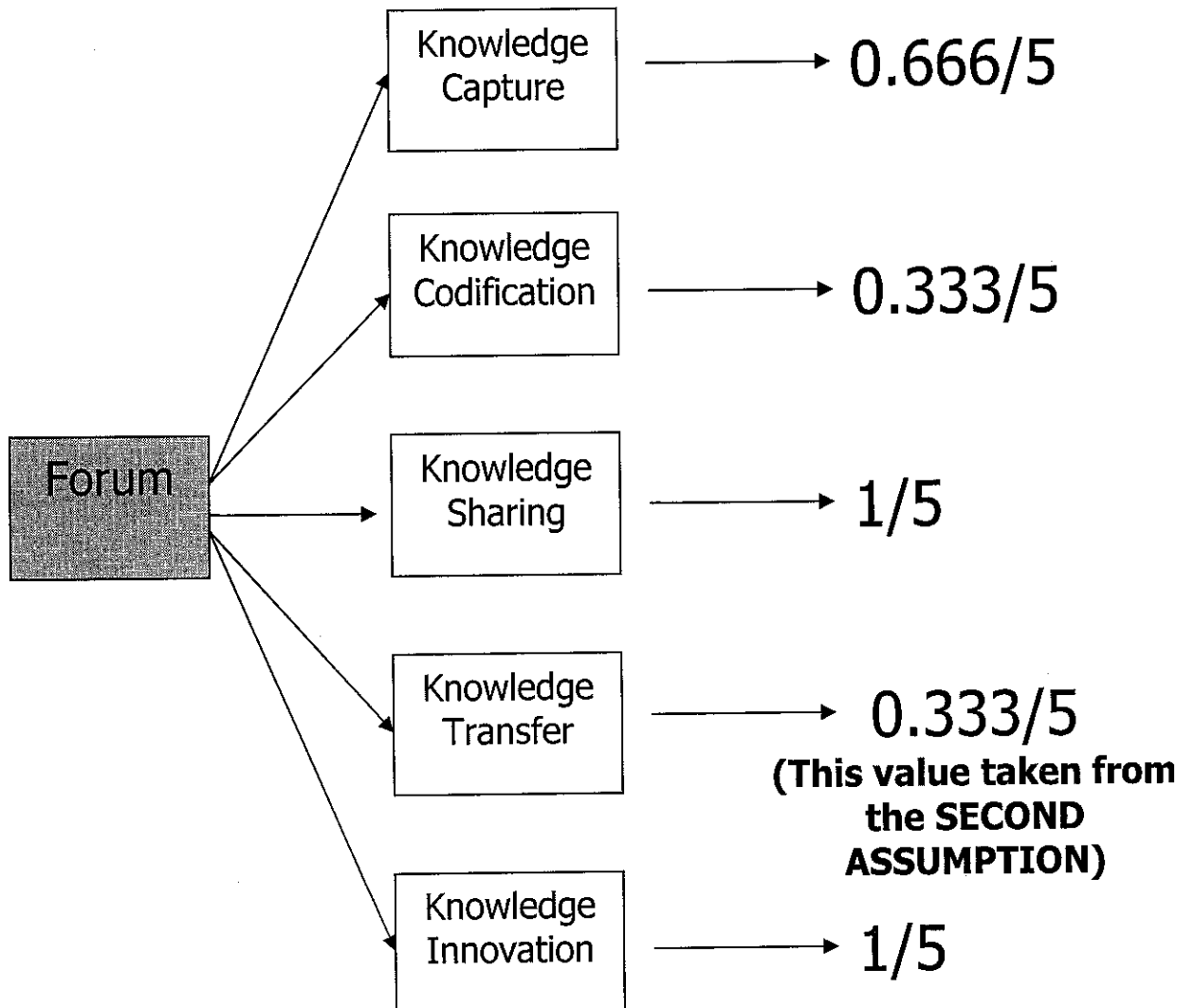


Each focus areas been given a value $1 / 5$ which means **0.2**

From the technique used in Knowledge Transfer Focus Areas, apply the same technique to other four focus areas.

By referring the assumption used in previous discussion, take **SECOND ASSUMPTION** for Knowledge Transfer Focus Areas (**0.333**)

Give value to other four focus areas (Take Note: THIS VALUE IS AN ASSUMPTION)



Sum of all the Probability:

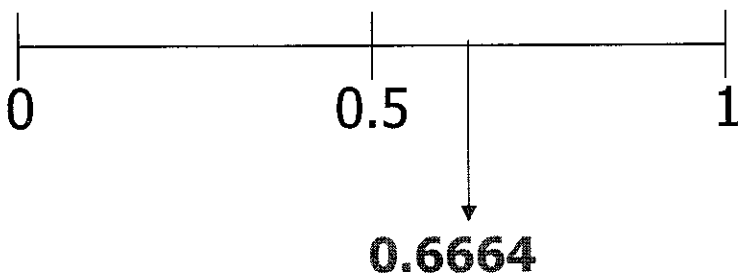
$$0.666 + 0.333 + 1 + 0.333 + 1 = \underline{3.332}$$

The sum then divided by 5

$$3.332/5 = 0.6664$$

Results:

The success weight is 0.6664



4.9 Other Finding

Besides the techniques using focus areas and probability, there is another technique available in measuring knowledge. But, this technique not was chosen because the previous technique is more simple and understandable to be complete within the timeframe.

Normally known, measurement is the process of assigning symbols (usually numbers) to attributes of entity in the real world. But in this project, measuring knowledge cannot just simplified by assigning symbols to it's because most knowledge is tacit and in people's heads.

Classes of entity in knowledge measurement:

- **Processes:** The system that function and related in activities of measuring.
- **Products:** Outputs from the processes; (example: deliverable). In this project, the product can be explained as the results of students understanding and knowledge they gain.
- **Resources:** Items required by processes. For this project, it refers to the users activities in the system.

Furthermore in measuring knowledge, there is distinguished of internal and external attributes within each class of entity:

- **An internal attributes:** Is one that can be measured by examining the product, process, or resources itself, and can be separated from its behavior.
- **An external attributes:** Is one that can be measured only with respect to other entities in its environment.

Example: How many time students participate in posted an answer?

It is an internal attributed, as it related to the activities student done. In contrast, what student posted as an answer is an external attribute of resources, because it depends on the student's skills. It must be noted here that measure the external attributes cannot be done directly without reference to internal attributes

CHAPTER 5

CONCLUSION & RECOMMENDATION

5.1 Conclusion

This measuring knowledge system analyze a best technique to measure the student's knowledge in a concept of Visual Basic programming, and involves eliciting the full set of elements a student has in memory about that concept.

In measuring the student knowledge, an elements that push into concern in creating the measuring technique is each student don't have a same understanding and accepting in learning knowledge. Each student's mind in a classroom is different receptor, the pattern of images, text and other elements will differ even if the learners share extensive common experiences.

Hence, what student make of the instruction will differ and their understanding and knowledge been gain will not be the same. That is why the need of this system is to identify the level of student's knowledge gain after learning.

As the conclusion, Measuring Knowledge for Visual Basic's Student exactly shows how forum can be used as a facilitator to measure knowledge process by identified characteristics available through the forum. By using Brand Equity and Probability as an indicators in measuring it gives a way to measure knowledge process in the forum.

Lastly, the result comes up with a value of knowledge been measured rank between 0 until 1.

5.2 Recommendation

For future enhancement, hopefully this system would be more effective as a working forum as by that the functionality of measuring techniques can be clearly seen and evaluate.

Hopefully they would be a research done in creating metrics to measure other tools such as; the chat room, bulletin board and etc.

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APPENDICES

CASE STUDY

One company in Sweden called Skandia begins to measure some of the elements of intellectual capital, and the technique can be an example and give a point in creating a measuring technique for Measuring Knowledge System of Visual Basic's Student.

Skandia been inspired by the trend towards qualitative performance measurement tools such as innovation, personnel and customer satisfaction as the company later developed its own instrument to evaluate their intellectual and financial assets. Skandia resources is based on information likes; customer trust, trade name, distribution control, organizational culture, capital of management and etc.

The company seeks to develop core competence in managing relationships at both ends of its value chain, but not owning the resources being leveraged. In this way, the company business concept seeks to add value through information sharing and knowledge acquisition and generated inside the inner layers of the federative structure as well as the outer layers with 46,000 partners and over 1,000,000 customers.

Thus the total business concept is aimed at managing information and knowledge flexibly, yet at the lowest cost possible, for continuous learning and change as the business structure responds to the environment of customer, partners, employees and stakeholders. In 1990 and 1991, Bjorn Wolrath, the president of Skandia Group and Jan Carendi, the director of Skandia Assurance and Financial Services (AFS) has pointed Leif Edvinsson to develop a way of systematically assessing Skandia AFS's intellectual capital.

Edvinsson begin his task by devoting consideration time to articulating the 'hidden value' concept to colleagues throughout the company's offices around the world and by focusing on building awareness among AFS board of directors concerning the need to systematically uncover the hidden value

During 1992 and 1993, Edvinsson and a small team developed the first set of intellectual capital indicators which were summarized as eight major intellectual capital focus areas. The eight focus areas later been simplified to four; financial focus, customer focus, process focus and renewal and development focus. In 1994 – human focus- a fifth focus areas been added.

KNOWLEDGE & INFORMATION CONVERSION PROCESSES

- Converting knowledge to knowledge

Develop a forum where student cooperate and communicate directly with others

Using forum as a medium knowledge transfer among others

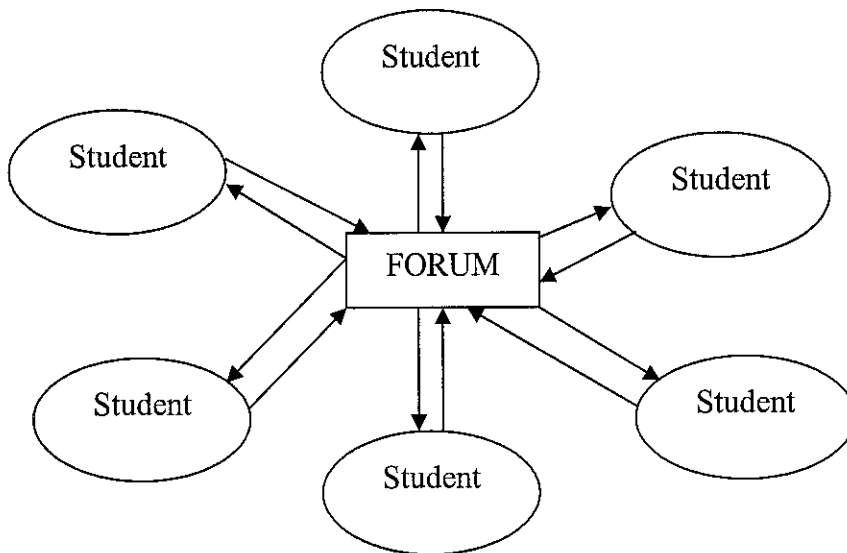


Figure 8: Forum as a Medium

- Converting knowledge to information

Student using technology; like this forum to documented and make the tacit into explicit knowledge, and later share it among others

Promoting the conversion of know to 'shareable' information is a 'high-trust' culture.

Student must willing to share their knowledge with each other and make it explicit through the use of forum for others to learn from and use

- Converting information to knowledge

Forum is where student seek out and act on all information they have receive.

‘High-trust’ culture based to the level of acceptance student has in the quality and integrity of information that others receive through the forum

Student free to share and use information and knowledge.

- Converting information about information

Forum function to turn student personal knowledge and information to ‘structural’ capital as it benefit others in long term time.

Reduce risk of knowledge leaving in the minds of students without sharing with others.

Example: when student not learning and use Visual basic anymore.

Forum captures knowledge and deposited into the system.