

KNOWLEDGE MANAGEMENT IN TEACHER EDUCATION PROGRESS AND FUTURE PROSPECTS

A guideline for evolving an intellectual capital statement for teacher education

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This paper develops a practical guideline for intellectual capital measuring and reporting in the context of teacher education institutions.

Intellectual capital is obviously the foundation for knowledge centric organizations like teacher training colleges. According to Bertrand Russell: "The defence of the state in all civilized countries is quite as much in the hands of our teachers as in those of the armed forces". Indeed it is teacher-training colleges with its Intellectual Capital base, which help shape future teachers for the society.

Intellectual Capital

Intellectual Capital constitutes the most valuable organizational resource of an organization. It represents a group of intangible resources of strategic value that does not appear in the financial statements of the organization.,

in spite of contributing to the creation of organizational value. For an organization, intellectual capital is not only key to the creation of a competitive advantage but also for its long-term maintenance.

The literature of intellectual capital emerges at the beginning of the 1990s, with the pioneer research of Leif Edvinsson and Karl-Erik Sveiby. Intellectual capital literature covers diverse typologies of intellectual capital that have been developed recently although it seems that a consensus has already been reached regarding the components of intellectual capital. Thus intellectual capital is formed by

- human capital
- relational capital and
- Structural capital.

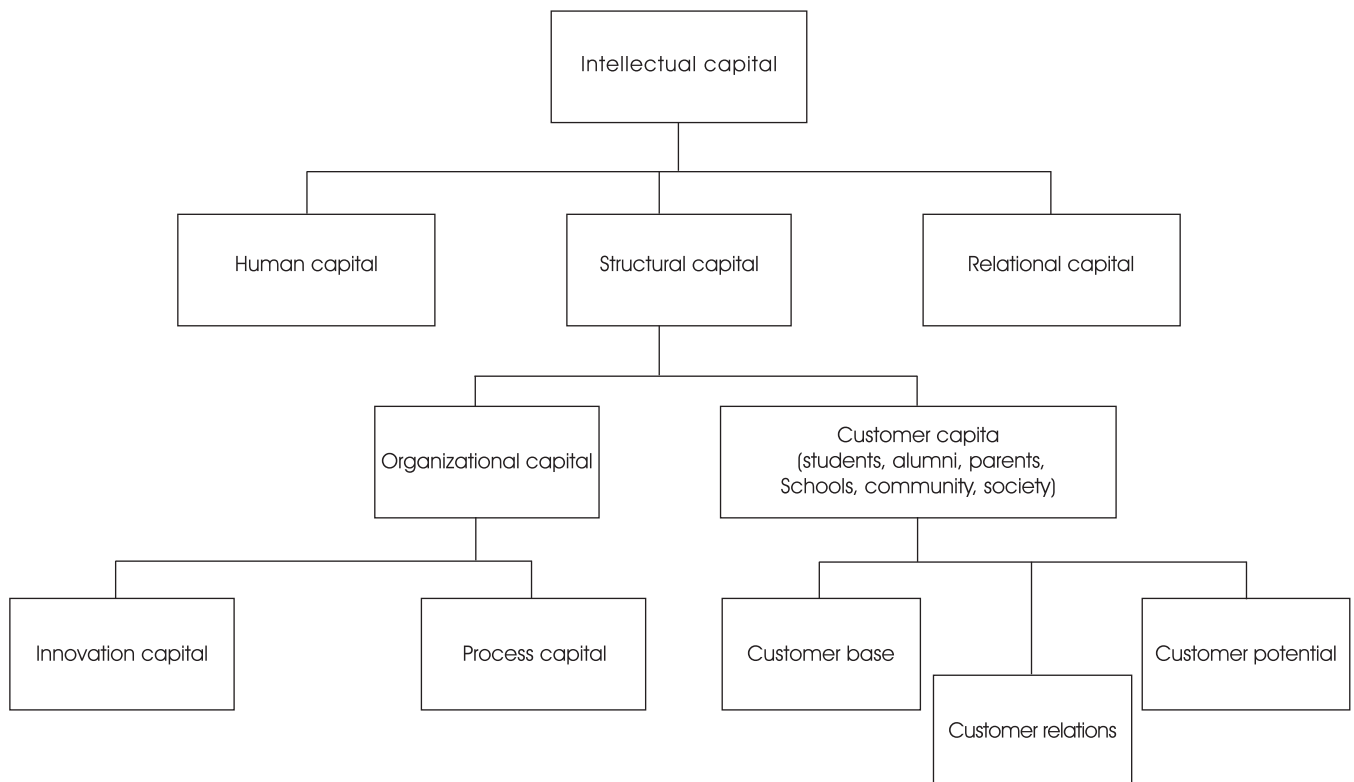


Figure 1: Intellectual Capital- adapted from Skandia value scheme

Human capital reflects the set of knowledge, abilities, skills and experience of the employees of the institution. It also includes an even more intangible element the motivation of the employees. Human capital, Stewart stresses grow in two ways: when an organization uses more of what people know, and more people acquire more knowledge that is useful to the organization. Maintaining competitive edge in today's world means that organizations must use their people, their human asset, as efficiently as possible.

Relational capital shows the value of the relationships in the institution. In general, it has been accepted that these relationships were mainly focused on customers, suppliers, shareholders, 'stakeholders' and the society, without including the employees of the firm, hence adopting an external perspective. However, it is clear that the relationship of a teacher training institution with its employees, particularly, teaching staff, generates value and for this strategic reason it is necessary to bear them in mind. Similarly it is convenient to differentiate between internal relational capital or feedback capital and external relational capital or feedforward capital. Feedback capital includes the value of the strategic relationships created between the institution and its employees. Feedforward capital represents the external perspective of relational capital and includes the relationship of a teacher training institution with key agents for organizational survival: students (users), parents (payers), potential employers like schools (buyers) and society, current and potential, regional and national administrations, and the environment, among others.

Structural capital represents the institutional knowledge, which has moved, from individuals or the relationships between individuals to be embedded in organizational structures, as is the case with organizational culture, routines, policies or procedures. Using knowledge and information, sharing it with an organization and transporting

it internally and externally are what make up structural capital. Basically, it packages human capital and enables it to be used in order to create value or wealth for the organization. Structural capital comprises customer capital (the propensity of customers to keep on being customers) and organizational capital (which includes innovation activities).

In the case of human capital, the stock of knowledge is available at an individual level; that is to say, this knowledge belongs exclusively to each of the employees of the organization who uses it in his/her daily work in a voluntary way. A teacher training institution is not the owner of this valuable resource, it simply uses the knowledge, and therefore, an important problem appears here. How does the institution make sure that this knowledge will be available whenever it needs it?

Structural capital, as indicated in Figure 1, can be further classified into customer and organizational capital. Customer capital is the value of an organization's relationships with the people with whom it does business or who make up its constituents for example, in a teacher education institution, customer capital would refer to its relationship with its students (user), parents (payer), alumni, schools and society (buyer). Organizational capital comprises innovation and process capital. Process capital includes work processes and technical solutions, and innovation capital embraces such intangible assets as intellectual property and institution strategies and secrets.

This question shows a first feature of intellectual capital: it is an intangible resource neither the property of the institution nor legally protected as is the case with intellectual property, for example. Without doubt, this feature transforms intellectual capital into a key piece of organizational strategy. A first step toward the management of this resource is its measurement. Only what is measured, gets done.

Intellectual Capital in the context of teacher education

The human or intellectual element of 21st century organizations is a key performance indicator and, as such, should be recognized, protected and nurtured by employers to maintain and improve overall performance of the organization. The ability to learn, co-operate and innovate faster than other companies and institutions has become the main sustainable source of competitive advantage. Therefore, to stay competitive, institutions need to capitalize on their intellectual assets, or 'capital', rather than, or as well as, their infrastructure. The prosperity of teacher training institutions will become increasingly dependent on the intellectual capacity of their employees-both teaching and non-teaching - and their ability to change and adapt to a dynamic teaching /learning environment.

bereft of such crucial information, they are effectively operating or restructuring in a vacuum. So, they might be making expertise redundant which they may have to retire.

Why measure Intellectual Capital in a teacher training institution

To gain a complete picture of the real performance in terms of value creation, preservation and realization of a teacher training institution, all aspects of the institution must be considered. In order for an organization to reach its full potential for value creation the intellectual capital components must not only be identified correctly, but effectively and efficiently utilized.

Measuring and reporting of the intellectual components of a teacher education institution would lead to the following benefits:

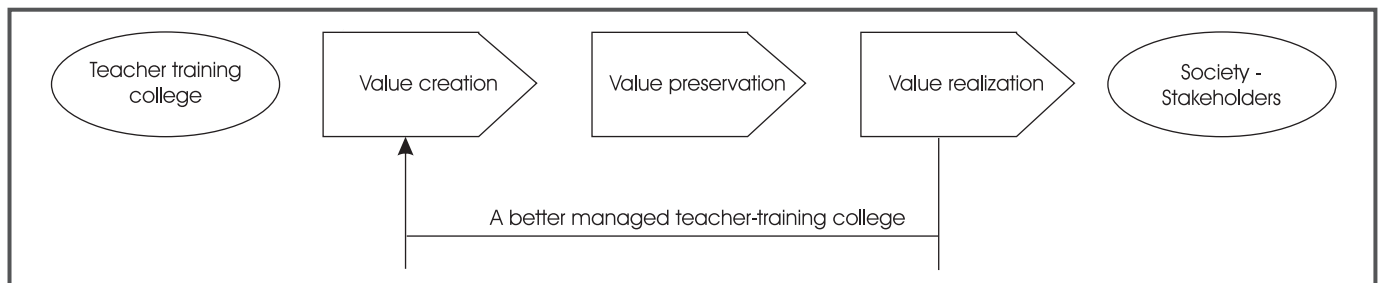


Figure 2: The Value Reporting Flow Teacher training college

Intellectual capital is the collective reference to the intangible assets of an organization. In the words of Stewart: "Intellectual capital is intellectual material knowledge, information, intellectual property, experience-that can be put to use to create wealth." The capacity to measure intellectual capital and manage knowledge can represent the success or failure of enterprise in the 21st century. A teacher training institution may not know if it has the people, resources or business processes in place to make a success of a new strategy. It might not know what expertise, management potential or creativity it has access to through its employees. Because institutions are

- ✓ Ability to track changes in the value creating potential of the teacher training institution
- ✓ Identification of the component with the largest marginal value creation allowing for better resource allocation
- ✓ Ability to make allowances for trade-offs between changes in value perceived by different stakeholders

The key questions to be asked for devising a suitable methodology for measuring intellectual capital in a teacher education context are:

- ✓ Who are the stakeholders that determine value?
- ✓ What resources are needed to start, to continue or to create value?

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- ✓ What system is needed in this institution to deploy these resources?
- ✓ How efficiently does this system operate?
- ✓ How is the value to be measured?

This paper presents an analysis model for intellectual capital statements applicable for teacher training institutions. The ability to analytically read intellectual capital statements is dependent on the ability to develop a general method for understanding their common characteristics, made possible by an accounting system. Such a system has to be based on the intellectual capital statement classified into relevant categories for meaningful qualitative and quantitative assessments.

The starting point is to group intellectual capital statement figures in such a way that the three general questions on resources, activities and effects, pertaining to teacher education institutions can be answered.

Intellectual capital statement for a teacher training institution

Resources:

How is the teacher training institution's knowledge resource comprised?

Activities:

What has the teacher training institution done to strengthen its knowledge resources?

Effects:

What are the effects of the teacher training institution's knowledge management work?

Each of the four main knowledge resource categories usually found in intellectual capital statements (*employees, customers, processes and technologies*) should be analyzed for each of these three evaluation criteria. This gives a **3 x 4 analysis matrix**.

Analysts who have tested the method on a number of intellectual capital statements for companies have found

Evaluation criteria Knowledge resources	Effects What happens	Activities What is done	Resources What is
Employees	• • •	• • •	• • •
Customers	• • •	• • •	• • •
Processes	• • •	• • •	• • •
Technologies	• • •	• • •	• • •

Figure 3. Analysis model for intellectual capital statements.

(Adapted from "Analyzing Intellectual Capital Statement" - a document published by Danish Ministry of Science, Technology and Innovation 2003.)

this difficult to use at first, but have meaningfully refined it for use.

The analysis model's evaluation criteria are based on the figures linked to the three principal questions:

- ✓ How is the teacher training institution's knowledge resource comprised?
- ✓ What has the teacher training institution done to strengthen its knowledge resources?
- ✓ What are the effects of the teacher training institution's knowledge management work?

Resource figures are the *portfolio* of the teacher training institution's *knowledge resources*, which is the stock and composition of resources within employees, customers, processes and technologies.

These figures represent the teacher training institution's 'stock' of knowledge resources and define which 'resource building blocks' the teacher training institution has at its disposal. The figures relate to relatively stable units such as 'a customer', 'an employee', 'a computer', 'a process' etc. They answer questions such as 'how many?' and 'what proportion' and show how large, how varied, how complex and how intertwined these knowledge resources are. Linked to this are management actions, which are portfolio decisions determining how many knowledge resources of each type the teacher training institution is to own.

Activity figures describe the teacher training institution's *activities for upgrading knowledge resources*, which are activities implemented to upgrade, strengthen or develop the resource portfolio. The figures also answer questions such as 'what is being done?' For example, what does the teacher training institution do to develop and improve its knowledge resources, through further training, investments in processes, activities to educate or attract customers, presentations etc? The management actions linked to these are therefore upgrading activities.

Effect figures express the consequences or the *total effect of the teacher training institution's development and application of knowledge resources*. Just as in an accounting system, the model only shows the effects and does not attempt to explain where they come from. Such explanations are for the analyst to find based on the model but not within it. The analysis model is not a narrow input-output model. There is not necessarily a direct relationship between initiatives and effects in the same area, for example retraining employees and increased employee satisfaction. The effect of such an initiative may arise as a customer effect. Technical staff may become more skilled and are able to provide teacher trainees-the customers- with better service. The analysis is designed to define these 'many to-many relationships' in the model.

Classification of indicators

Ideally, intellectual capital statement indicators already contain the information required to classify them in both dimensions. The dimensions can be considered to be inherent in the figures, which always refer to a particular *aspect* of a particular type of knowledge resource. This is often the case, but in practice it is often difficult to set boundaries. Rules of thumb can be used to classify the intellectual capital indicators in both dimensions.

For **resource figures**, classifying the indicators according to type of knowledge resource usually will not present any major problems.

Activity figures often create confusion, because some activities upgrade two (or more) different types of knowledge resources at the same time. For example, sending employees on process optimization courses can qualify as both an employee and process activity. The rule of thumb in this case can be to position the figure on the *knowledge resource, which is put most in focus*. Parent teacher meetings should therefore be positioned under customer resources and not under employee resources. This also applies to conference representation, because the teacher training institution's image (customer resource) is in focus. The employee resource is not in focus even though employees represent the company at the conference. Special problems can arise where effect indicators are to be positioned in the model, because they may relate to more than one type of knowledge resource. For example, where 'employee satisfaction with technologies' and 'customer satisfaction with employee competencies' are to be positioned. The rule of thumb is that the figure should be classified according to the *qualities it describes*. This means that 'employee satisfaction with technologies' should be considered to be a technology quality and should therefore be positioned as a technology resource. Applying the same principle means that 'customer satisfaction with employee competencies' should be classified as an employee resource. Many intellectual capital statements use abstract categories, which are not suitable for indicator classification. For example, 'innovation', 'flexibility', 'customer-orientation' and 'strong culture' are all abstract concepts not initiatives, and are rather knowledge narrative elements. 'Innovation' is such a broad concept that it is impossible to say where 'innovation figures' belong

in the model. They should be split with respect to the activities and knowledge resources they relate to. 'Innovation' is a strategy that is illustrated using a series of diverse indicators, which should be *interpreted* as a whole. The same applies to other combined concepts such as 'flexibility', which may range across numerous activity types and therefore be represented by many different indicators.

Goal of the analysis

An analyst's view of the model is that it should usually be read in 'columns'.

- ✓ The knowledge resources column provides the basis for a 'portfolio assessment' of the teacher training institution. The analyst will determine whether the teacher training institution's knowledge resource portfolio is competitive and can meet the future.
- ✓ The activities column allows the management's ability to develop the employees, the organization and customer relationships to be evaluated.
- ✓ The effects column provides the basis for assessing whether the teacher training institution's knowledge management set-up and activities work, giving an assessment of the teacher training institution's stability.

The columns can be read in random order, as they are not closely interlinked. The columns only become interlinked when the three statements given by the columns are set side by side and a reader begins to use them to develop his own version of what is going on in the teacher training institution.

The Analysis Model for ABCD

A Sample Case Study (Annexure A) shows how the systematic analysis model can be applied to a teacher training institution's intellectual capital statements. The example is the intellectual capital statements from ABCD Teacher Training College, Chennai. The interpretations presented here are given to illustrate how the model works. They do not represent any form of comprehensive analysis of the teacher training institution's intellectual capital statements or strategies.

Figure 4 shows the development of a number of selected indicators. For evaluation, both temporal (year wise improvement) as well as cross sectional that is, peer comparison with similar institutions, could be attempted.

Resources:

ABCD's staff size is growing, particularly the number of management staff. E-learning competency is growing.

ABCD's customer relationships are very long term but projects are large and few in number. The teacher training institution is becoming less and less dependent on each customer, which is reducing risk. It has begun to describe the extent of elements in their internal processes and procedures.

Activities:

ABCD focuses on developing its employees. High levels of resources have been invested in the teacher training process and product development.

Effects:

There is a wide range of effect indicators for employees. These show that employees are very satisfied with working for ABCD. A set of indicators has been developed for customer related effects. Their development has been described very briefly, with the exception that there has been a stable influx of strategic customers. Process effect figures are, however, very much in focus. These show that ABCD is gradually improving its project management.

ABCD's intellectual capital statement shows an institution that is focused on developing its own processes, which it successfully achieves. It aims to recruit more faculty and nonteaching staff, which it also successfully achieves, and continuously invests in employee development. Overall, this indicates that ABCD's processes and procedures match the growth and that employee development initiatives also partly are aimed at training the employees in ABCD's processes. This hypothesis can be used in more

detailed analysis work. In addition to this, the teacher training institution has very long-term customer relationships. The customer portfolio is not expanding, but is not contracting either. This could mean that growth is from increased business with existing customers. This can indicate that the company has succeeded in creating a strong knowledge of the needs and problems of each of its customers.

This brief analysis provides a framework, hypothesis, which can be built on when reading the intellectual capital statement. The analysis gives the reader the ability to quality check the intellectual capital statement's text and evaluate whether the teacher training institution is sound. This evaluation arises where the intellectual capital statement text and the analyst's skill and ability to understand ABCD meet. The analyst him or herself must provide a gauge of what development healthy or unhealthy for the company. For example, is it 'healthy' that ABCD writes so little about customers and markets and so much about processes? Is the most important challenge in the company to become certified? The intellectual capital statement can give the impression that ABCD is attempting to develop a technology push company, and that this intense focus on technology takes some of the institution's attention away from its markets and customers.

Whether this is a necessity for ABCD or whether it represents a problem is for the analyst to decide.

The analysis indicates that the teacher training institution concentrate on its processes, and there may be good reasons for doing this. For example, it probably correct that good processes are needed to establish large projects, which is ABCD's business. It is also probably wise not to leave the operation of such large projects to the whims of the individual. Allocating considerable resources to stabilizing the organization in a period of exceptional growth is also probably a wise step.

The first visual observation is that ABCD's figures show indicators that are concentrated on employee resources and their effects, customer resources and their effects, and process activities and their effects. Upgrading activities are concentrated on employees and processes (even though the activities are carried out by the employees and the customers). There are some 'blank spots' in ABCD's intellectual capital statement.

These ambiguities may be due to the inability to find 'good figures' for all the activities that the teacher training institution implements. By taking a closer look at the intellectual capital statement text, the analysis model can be used to summarize any initiatives described in the text that are not presented in the figures. For ABCD, the initiatives are as follows.

The model can therefore also be used to structure the activities (and effects) described in the intellectual capital statement without attaching any figures. For ABCD, this supplementary analysis shows that the figures do not cover everything contained in the intellectual capital statement. Figure 5 shows that the teacher training institution probably does more to develop customer relations. Such information is of course less certain than other information that is substantiated by figures. This, however, can form the basis for the analyst's dialogue with the teacher training institution on its initiatives in this area.

This is a further example of how there are more resources and more activities than are described by the figures. In this case, the table shows that ABCD has more process related resources than the analysis model indicated in the first round. A deeper insight into customer and employee relations is also achieved. These are conditions that can add new dimensions to the interpretation of the institution and that can make ABCD's knowledge management strategy even clearer.

Conclusion

Even organizations with deeply ingrained Financial Perspectives have found it necessary to balance the scorecard of their performance with learning and growth perspective, "customer" perspective, and internal process perspective for better capture of the value creating activities that derive from intangible assets, that is, "The Invisible Balance Sheet". It is imperative that knowledge centric educational organizations need to follow suit. With this in view an attempt has been made in this paper to present a guideline for evolving an Intellectual Capital Statement for teacher education, in terms of three evaluation criteria resources, activities and effects for each of the four prime movers that is, employees, customers, processes and technology. A case study approach illustrating this approach for ABCD teacher training college brings forth its feasibility and utility. Such a 3 x 4 matrix with temporal (over the years) and cross sectional analysis (per comparison) for a teacher training college would assist significantly its growth of Intellectual Capital on healthy lines.

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