



Web Based Educational Systems: An Application of Information & Communication Technology

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ABSTRACT

The advent of digital technologies and the computerization of traditional media present major challenges to traditional schools and colleges. The analysis of the multiple challenges facing education force educators within academic institutions to evaluate the possibilities of alternative forms of course content delivery. Web Based Educational Systems (WBES) offer interesting delivery mechanisms to teachers and learners. Governance and accountability are key criteria to consider during the deployment of these WBES. Assessment of WBES also needs to be done to determine its effectiveness. The concepts discussed in this paper will encourage researchers to do empirical studies to determine whether Web Base Educational settings apply key principles such as governance, accountability, and effectiveness while offering curriculum over the Web.

Keywords: Governance, Accountability, Assessment, Stakeholders, E-learning, Web Based Educational system.

1. Introduction

The teaching world is shifting due to rapid changes in educational technology. The fast advancement of technology must continue to be viewed as both a need and a concern for teachers and learners. The advent of digital technologies and the computerization of traditional media must be planned properly and well implemented. "If schools and colleges do not keep up with these technological trends and deploy curriculum over the Internet in an effective manner, the level of services and instructional impact on teaching's outcomes could be significantly diminished". Web Based Educational Systems have to be well designed, well developed, and well implemented to enhance learning outcomes. The aim of this paper is to present a methodology as well as models to help learners, educators, teaching community to assess governance and accountability, while developing and deploying education through Web Based Educational Systems.

Secondary research objectives will be to:

- Discuss arguments as to why we need to worry about accountability and governance in a Web Based Educational (WBE) environment.
- Present governance model and examine the elements needed to enhance governance outcomes in a WBE setting.
- Describe the relationship between governance and accountability for WBE settings.
- Examine the assessment of WBES for its effectiveness.

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2. Accountability and Governance

It is one of the most important criteria in educational systems. Accountability means that the WBES must achieve academic performance while demonstrating that the actual results promote learning outcomes (the notion of transparency in education). WBE Programs, designed for schools and colleges, are developed and implemented, but sometimes fail to satisfy the accountability criteria.

Good governance means that boards of education fulfill their educational goals and strategies while maintaining public trust. Effective governance is critical to ensuring that educational bodies are successful and that the organization's mission is clear, appropriate, and relevant as times change. Effectively governing Web Based Educational Bodies continuously monitor their organization's programs and activities to be sure that they are aligned with the organization's mission and strategic goals. Governance in Web Based Educational settings also means that Web Based programs should be regularly assessed as to their performance in achieving the organization's mission and goals. Even there is greater need of corporate governance. As sound governance ensures that the management's goals of these WBES are in line with the goals of other major stakeholders. WBES strategies need to be soundly formulated and rigorously implemented in order to achieve satisfactory WBES performance.

Effective governance aligns Web Based System investment with overall priorities. It determines who makes the investments decisions and assigns responsibilities for the outcome. Successful Web Educational organizations, with senior management that have a clear understanding of the governance and accountability criteria, will present effectiveness and efficiency in the development and deployment of WBES. Accountability in WBES also assumes that educators, policymakers, and others know how to act on information to improve education. Effective WBE governance demands that senior management define educational business performance objectives and actively identify governance to facilitate behavior that is consistent with these objectives.

- What educational activities should be implemented to render adequate and effective service to learners and teachers?
- Is an e-business approach used to promote WBE programs?
- Are e-learning concepts applied to the WBES that was developed?
- How are these Web Based Educational services priced?
- What are the plans to keep these WBES up-to-date?
- Is there a formal evaluation method in place to assess WBES?
- Who will measure the learning outcomes of these WBES and report the results to the stakeholders?

3. Governance and Web Based Educational Setting

Well-designed, well-understood, and transparent governance mechanisms promote desirable behavior and individual accountability. The WBE governance model, shown in Figure 1, encompasses five major decision areas. In thinking about who should make, and be accountable for, these decisions; the following questions should be addressed and their results studied.

WBES Principles:

- What is the role of WBES in the educational setting?
- What are desirable behaviors?
- How will WBES be funded?
- Is the educational business's goals and strategies aligned with the WBES's goals and strategies?

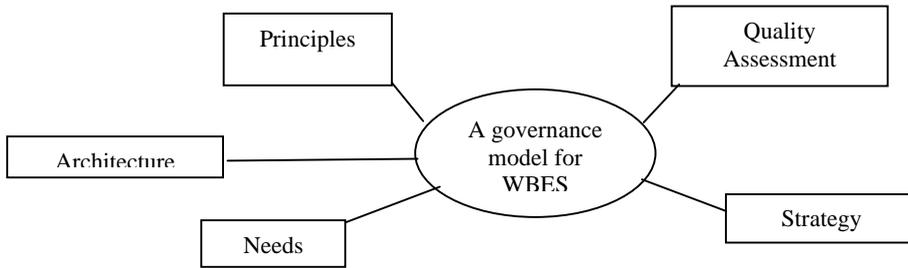


Figure 1: A model for Web based Educational System

WBES Architecture:

What are the core business processes of the education setting? How are they related?

- Is the Value Chain model used to eliminate non-valued-added activity?
- What technical capabilities should be standardized enterprise-wide to support efficient educational processes and facilitate integration?
- What technological choices will guide the enterprise's approach to WBES initiatives?
- Was a systems approach used to design and develop the WBE application?

WBES Strategies:

- What WBES strategies are most critical to achieving the educational setting's objectives?

WBES Needs:

- What are the markets and opportunities for new WBE applications?
- How are the strategic experiments designed to achieve success and accountability?
- How can the needs of a business be addressed within WBES architecture?
- If organizational change is necessary to institute positive educational outcomes; who will take the responsibility and be accountable for it?

WBES Quality Assessment:

- Is there a Quality Audit Monitoring system in place?
- What process changes or enhancements are strategically most important for the enterprise to gain a competitive business advantage?
- How is the business and educational value determined following the implementation of WBE application?

Educational organizations that have asked the above questions and reported the results have demonstrated success in designing, communicating, and refining a WBES that creates real business value within the institution. To assure effective governance while deploying WBES, management needs to communicate important results to key stakeholders in order to assess its effectiveness. Good communication and proper reporting on educational outcomes generally means more effective governance for educational business enterprises.

4. Finding possibility of linking Governance and Accountability for WBES

The subject of accountability seems to be universal. Good governance also requires accountability. The assigning of responsibility and ownership, as well as some form of measurement and performance management are needed in order to ensure compliance and effectiveness, as shown in Figure 2. Many organizations have implemented a strategically oriented set of learning and lagging performance indicators grouped into four perspectives: financial, client or stakeholder, internal process, learning and growth.

Stakeholders should develop and implement above strategy in a WBE setting to provide a framework that examines accountability and governance. Organizations that develop and use WBES can cascade results down the corporate hierarchy to make the strategy clear to everyone involved.

The accountability model presented in figure 2 links the key elements discussed in this paper. This model shows an integration of board governance, performance measurement, quality monitoring and reporting processes as well as management planning and control. These systems have to work in synergy in order to achieve accountability and to monitor the progress and effectiveness of the WBES. Employees and managers have to align their actions with key strategic goals and position themselves to demonstrate the accountability demanded by the learners, owners, and learning communities around them. A clear definition of the vision and mission for these WBES is essential to defining key strategic goals. These goals must be articulated with precision and clarity, in a way that is compelling for all partners involved. Next, leaders must establish a strategic governance system whereby the decisions and behaviors of major players are constantly driven by these same goals. Finally, performance measures must be well-defined in relation to the goals. These performance measures must be tightly woven into the fabric of the organizational life and integrated with the key processes that run the operations and influence the positive actions of every employee.

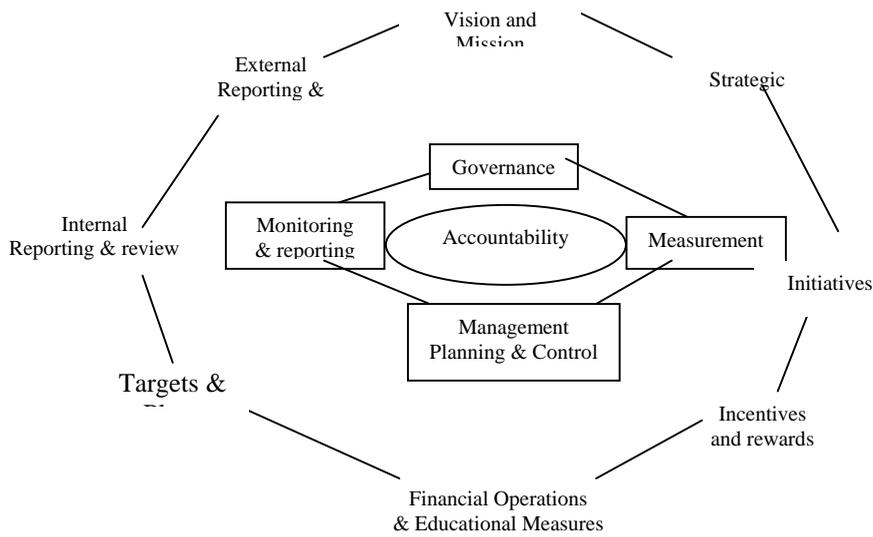


Figure 2: The Accountability cycle in WBE setting

5. Assessment of Web based Educational System

Some WBE organizations use an e-business approach in developing a portal to their academic programs. E-Business presents new opportunities for clients and possibly new markets. E-Learning, using a Web-enabled platform, can be useful both as an educational environment for facilitating learning at schools and colleges, and as an environment for efficient and effective training. Figure 3 shows three key domains that stakeholders, information technologists, and end users should evaluate: management, technology, and human interaction. The management domain includes several determinants or factors, such as clients' needs, strategy, and others, as shown in Table 1. If the client is not satisfied with the online curriculum and his needs are not met, top management will have great difficulty to economically justify a WBE Application.

The following management factors have to be examined in order to ensure the success of deploying Web

based programs: learner’s loyalty; learner’s behavior and attitude; learners’ profile; online learner’s experience (both social and cultural); learner’s service; and price for the educational service. An assessment of the management domain could reveal that a WBE route is the way to create better business opportunities for the organization and to take a strategic competitive advantage in the market. An ample management assessment will help the stakeholders to better understand their clients’ needs and to extend their educational business reach to meet the right e-learning target audience.

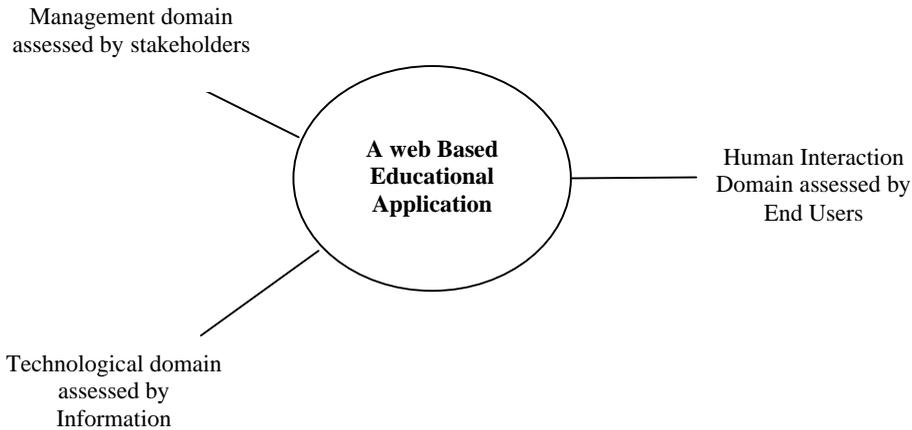


Figure 3: Evaluation of WBE application

5.1 List of evaluation determinants for a WBE application

Management domain: Clear WEB vision and mission, clients’ needs, clients’ satisfaction, clear WEB strategies and goals, cost effectiveness, learning Styles, WEB application’s justification, management changes, policy and ethics, training, target audience, etc.

Technological domain: Integration with databases and other applications, correctness, reliability, efficiency, integrity, security, reusability, portability, maintainability, usability, reusability, flexibility, etc.

Human Interaction domain: Intuitiveness, on-line help and assistance, easy of use (sophisticated search capabilities), user-friendly (uses different media types), multilingual (supports several languages), easy to understand (avoids ambiguous terms), easy to change information (in case of erroneous data being entered), quick feedback on the transaction being processed, client’s loyalty, etc.

5.2 A methodology to assess WBE systems

Stakeholders and senior management usually define business expectations, such as better service to the client and higher return on the investment. These stakeholders hope that WBES will meet their business expectations. The owners of a WBES have to economically justify the WBE application based on a cost-benefit analysis (cost effectiveness). An organization faces continuous challenges, such as new media and technology. Managers have to plan, coordinate, and supervise these changes in an adequate manner. Proper training, as well as professional development programs, for educators is necessary ingredients to ensure the success of the WBE application during its operation.

Management factors such as mission, vision, and strategy should be evaluated to determine the effectiveness and efficiency of the WBE application. Media and resources used in the WBE application,

goals and strategies, supply chain values, ethical issues (protection of confidential information and its uses), and the system quality have to be assessed before, during, and after the implementation of the WBE model. Constant changes in the environment such as new Web media, culture, new business trends and competition, will require WBE settings to make adjustments in order to grow and adapt to clients' needs. In his paper designing a Web Based Instruction prototype, St-Pierre describes the characteristics of an effective WBE application. The technological domain includes several factors such as reliability, efficiency, integration, flexibility, interoperability, as well as others, as shown in table 1. The technological domain consists of quality factors that can be broadly categorized into three classes according to McCall, Richards, and Walters. The first class contains those criteria (reliability, efficiency, usability) that pertain to the use of the WBE application after it has become operational. The second class concerns the maintainability (testability, flexibility) of the WBE system integrating all WBE applications. The third class includes factors (portability, reusability, interoperability) that reflect the ease with which a transition to a new environment can be made. St-Pierre argues in his research that business enterprises must implement effective network infrastructure in order to support WBE applications. A technological study including several determinants, such as reliability and feasibility, must be addressed.

The human interaction domain requires the assessment of key elements in the user interface design with respect to the presentation of information (quality, quantity, accessibility), display of presentation (quality, text appearance, colors and graphics), and usability (ease of navigation, effective task completion, effectiveness of the business link). These determinants, presented in table 1, must be evaluated carefully so as to encourage the effective use of e-learning by both the teachers and the learners. An evaluation of the usability of the WBE site, based on potential user feedback and observations, will help senior management to determine its probable success.

6. Concluding Remarks

Accountability and governance criteria were discussed in this paper to help stakeholders in educational settings to determine whether owners of WBES are answerable to the world of education. An accountability model was discussed to help WBES management implement key components in order to achieve accountability in relation to governance. The field of WBES is evolving, especially due to the changes in Web technology, new communications media, young learners' needs, the work force, and others. Several WBES have been implemented and management needs to evaluate them in order to determine their effectiveness. Senior management should design and develop WBES that enable educational organizations to collaboratively devise, enlarge, deploy, and administer sound WBE application.

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