

2017

## Strategic Analysis of the Role of Information Technology in Higher Education – A KPI-centric model

Linda C. Gordon

*University of La Verne, lgordon@laverne.edu*

Erin Gratz

*University of La Verne*

David S. Kung

*University of La Verne*

Harold Dyck

*California State University San Bernardino*

Frank Lin

*California State University San Bernardino*

Follow this and additional works at: <https://scholarworks.lib.csusb.edu/ciima>



Part of the [Management Information Systems Commons](#)

---

### Recommended Citation

Gordon, Linda C.; Gratz, Erin; Kung, David S.; Dyck, Harold; and Lin, Frank (2017) "Strategic Analysis of the Role of Information Technology in Higher Education – A KPI-centric model," *Communications of the IIMA*: Vol. 15 : Iss. 1 , Article 2.

Available at: <https://scholarworks.lib.csusb.edu/ciima/vol15/iss1/2>

This Article is brought to you for free and open access by CSUSB ScholarWorks. It has been accepted for inclusion in *Communications of the IIMA* by an authorized editor of CSUSB ScholarWorks. For more information, please contact [scholarworks@csusb.edu](mailto:scholarworks@csusb.edu).

## **Strategic Analysis of the Role of Information Technology in Higher Education – A KPI-centric model**

**Linda C. Gordon  
Erin Gratz  
David S. Kung  
University of La Verne  
USA  
[lgordon@laverne.edu](mailto:lgordon@laverne.edu)**

**Harold Dyck  
Frank Lin  
Department of Information and Decision Sciences  
California State University San Bernardino  
USA**

### **ABSTRACT**

*The KPI-centric Strategic Model regarding the Role of Information Technology developed in this research is based on specific details from the University of La Verne's participation in the 2014 Educause Center for Analysis and Research (ECAR) Study of Undergraduate Students and Information Technology as a benchmarking participant. It also draws on the experience and directions of other institutions such as California State University, University of California. As one of the participating 213 institutions, the University of La Verne's undergraduate student responses generally mirror the majority view of students enrolled in all institutions of higher education in the United States surveyed as to preferences for the use of technology in the delivery of courses.*

*This case study examines key data points from the ECAR Study of Undergraduate Students and Information Technology published in 2015, comparing and contrasting all U.S. institution findings with those that are case specific to the University of La Verne. The authors then provide a model for utilizing key performance indicators (KPIs) measuring subjective, descriptive outcomes such as student expectations and student satisfaction with the use of Information Technology in course delivery. The model is presented within the framework of a Balanced Scorecard in order to achieve data-driven continuous improvement toward institutional strategic vision, mission, goals and objectives. This case study may serve as a template for other institutions of Higher Education to develop their own Key Performance Indicators and Balanced Scorecards to not only improve their own institutional performance to goals and objectives, but to provide opportunities for institutional benchmarking in the utilization of Information Technology.*

**Keywords:** Information technology, higher education, strategic analysis, KPI

## INTRODUCTION

University of La Verne has become a distance education pioneer. Established in 1891 as the Lordsburg College, the institution initiated its programs with a student enrollment of 72 students (Hogan & Muir, 1998). Today the University of La Verne is a private Tier 2 Doctoral Granting Institution. The university is located in Southern California, approximately 30 miles East of Los Angeles. Enrollment in academic year 2015-2016 is 8,334 full time equivalent (FTE) students. Student enrollments include undergraduate and graduate students based among the main campus, regional, and online campus programs (University of La Verne, 2016, p. 2). Enrollments are distributed among the College of Arts & Sciences (2,582 students), College of Education & Organizational Leadership (474), College of Business & Public Management (2,059), College of Law (191), and 99 students undeclared majors (University of La Verne, 2016, p. 3-4).

### **International and Military Distance Learning Programs**

Presently the off-campus and online programs account for 41% of the University of La Verne's total enrollments (3,415 students). The institution is distinguished as one of the early distance learning institutions, serving distance learning students for nearly 50 years. The origin of off-campus programs began with the teacher education department which developed master's degree programs to meet increased demand throughout the state of California. By 1970, due to growing demand for non-traditional adult education programs, the university shifted emphasis from on-campus programs to off-campus programs. As an early adopter of distance education, the University of La Verne opened campuses in Athens, Greece and supported military education sites in Italy.

La Verne College, as it was named then, established the School of Continuing Education to expand its off-campus programs, and initiated "residence centers" on military bases located at Point Mugu, Vandenberg, and North Island located in San Diego (Hogan, et al., 1990). Military residence centers were expanded during the 1970's to include Subic Bay Naval Station in the Philippine Islands, and, in 1975 a naval base at Athens, Greece and Naples, Italy. At this time undergraduate enrollments at the main La Verne College campus were 728 Full Time Equivalent (FTE) while the off-campus residence center undergraduate program enrollments were 662 FTE, or 48% of total undergraduate enrollments (Hogan, et al., 1998).

As of 1985 the School of Continuing Education (off-campus programs) had "...undergraduate and graduate courses offered at approximately 18 locations from Long Beach to San Bernardino and north to Santa Barbara" (Hogan, et al., 1990, p. 208). Enrollments on the main campus totaled 1,615 FTE while enrollment in Continuing Education was approximately 2,450 FTE, which represented 5,000 students.

In addition to the two military education sites in Italy and the three California military Residence Center programs, in 1975 the School of Continuing Education opened Residence Centers "...in Alaska at Elmendorf Air Force Base, Anchorage, Eielson Air Force Base near Fairbanks, and several years later at Fort Wainright in Fairbanks" (Hogan, et al, 1990, p. 219). By 1980 there were "...30 Professional Development Centers with 50 percent of the students enrolled in education

courses and 40% in business programs. The remaining 10 percent were in healthcare and psychology.” (Hogan, et al, 1990, p.220)

By 1990 the School of Continuing Education (off-campus programs) continued to be the single largest unit at the University of Laverne with programs being offered at 80 locations within California and abroad. In the 1990’s the Western Accreditation Association of Schools and Colleges (WASC) considered the University of La Verne’s off-campus programs to be a model for other institutions of higher education to emulate. During that same time period the College of Business and Public Management successfully offered one of the first hybrid MBA programs to students in in Singapore.

### **Current Environment**

Today, the University of La Verne continues to offer off-campus programs to non-traditional adult students among nine regional campuses (San Fernando Valley, Ventura, Pt. Mugu and Port Hueneme, Vandenberg Air Force Base, Central Coast, Kern County, High Desert, Inland Empire, and Irvine) and online. Online students are currently confined to the geographic boundaries of California (an administrative policy, not a technical limitation). The university has since closed its global campus programs, instead focusing on its core geographic footprint in southern California. The university has, however, continued its long tradition of being an early adopter of technology components enhancing student learning in primarily hybrid learning environments.

### **Learning Management System (LMS) and Collaboration Technology**

In addition to the use of the LMS, Blackboard, the University of La Verne utilizes Cisco’s WebEx telepresence product for virtual communications. The University of La Verne’s library conducted interactive virtual library information sessions utilizing WebEx beginning in 2013. The library established the prototype model for the university to simultaneously access all off-campus students among the regional campuses and online population of students. Information literacy instruction sessions provided the ability for students and faculty to ask questions and share files and screens. The College of Education & Organizational Leadership and the College of Business & Public Management have adopted the use of WebEx in a number of undergraduate and graduate courses since 2014.

## **TECHNOLOGY ENHANCED LEARNING ENVIRONMENTS**

Rudestam and Schoenholtz, in their Handbook of Online Learning, second edition, attempted to address the sometimes confusing myriad of labels attributed to the use of information technology in the delivery of educational programs:

One of the difficulties in obtaining a clear sense of the literature on online learning is the multiplicity of terms used to describe the phenomenon. Commonly employed terms include *distance learning*, *distributed learning*, *online learning*, *computer-mediated learning*, and *e- learning*.

Some educational institutions conceived their mandate as training students who are geographically dispersed from one another and from the institutions themselves. They represent what has historically been known as distance education. According to the U.S. Congress for Technology Assessment, distance education refers to the ‘linking of a teacher and students in several geographic locations via technology that allows for interaction’ (Daniel & Stevens, 1998, p. 162). However, many distance learning institutions that have come to adopt a strong online presence were functioning prior to the Internet by relying on individually directed study, mail, telephone, and/or infrequent residential sessions for contact between students and instructors...Because the term distance education had traditionally implied delivery of instruction or course materials over a distance, educators who support a model of education that emphasizes student initiated access to learning resources have recommended the use of the term distributed learning or flexible learning rather than distance learning to refer to new forms of online learning (Carr-Chellman & Duchastel, 2000). Distance education institutions have not necessarily embraced online learning, but when they have done so, the transition to a communication-based technology has often gone more smoothly because of the overlap of values and skills required to succeed in the virtual setting. As described later in this chapter, other distance education programs have been established solely online.

Perhaps the favored term in the literature today for designing courses and programs offered over the Internet is e-learning. E-learning has been defined by the Instructional Technology Council as “the process of extending learning or delivering instructional materials to remote sites via the Internet, intranet/extranet, audio, video, satellite broadcast, TV, and CD-ROM” (Holsapple & Lee-Post, 2006, p. 2). Nonetheless, the term that most accurately describes the contemporary trend of incorporating distance technology and the Internet into the educational process is *blended learning*. Blended learning refers to an amalgamation of face-to-face learning and online learning. The other term that is frequently used in this context is *hybrid learning*, again referring to the possibility of combining face-to-face and online modalities, either within the same course or across courses or programs within the same institution. (2010, pp. 2-4)

Notwithstanding the guidance offered by Rudestam and Schoenholtz (2010), above, there is no simple way to classify the use of technology in the classroom at most universities, including the University of La Verne. Although the University of La Verne has documented definitions for the various uses of technology, in practice, the University of La Verne, like most institutions of higher education today, can be said to universally incorporate the potential for e-learning in every course offered at the main, regional or online campuses. This is because for each course offering listed in the schedule of classes a LMS (Blackboard) course shell is created offering a variety of Internet-based instructional tools such as course email, blogs, wikis, embedded videos, document sharing, etc. This does not mean, however, that every course incorporates the use of any, some, or all of the available tools contained in the Blackboard course shells. At the University of La Verne, those courses that do utilize Blackboard technology in any way may or may not be defined as distance courses and therefore may or may not qualify to be described as “blended” learning environments (incorporating distance technology and the Internet into the learning environment) as defined by experts in the field such as Carr-Chellman and Duchastel.

The specific use of a combination of face-to-face and online learning at the University of La Verne (hybrid course formats) is more prevalent within the College of Business & Public Management and the College of Education & Organizational Leadership, primarily because programs offered by these colleges are available to the non-traditional adult student population both at the main campus and the regional campuses. The College of Arts and Sciences at the University of La Verne does not offer programs at the regional or online campuses, but rather individual courses as a part of the General Education (GE) requirements.

The University of La Verne defines an online class as one which "...does not require the student to attend the class in a traditional classroom setting...") and a hybrid/blended course as one in which "...the number of traditional face-to-face class sessions has been reduced significantly, 10% up to a maximum of 50%, due to online delivery..."). The University of La Verne melds the definitions of hybrid and blended courses together; the literature distinguishes the two.

### **FUTURE DEMAND FOR ONLINE COURSES**

The national trend for increased demand for online courses continues to be a significant segment of higher education demand:

The observed growth rate from IPEDS of the number of students taking at least one distance course was 3.7%, lower than previous online growth rates but still higher than the increase in overall higher education enrollments. The rate of growth in distance enrollments was very uneven; for profit four-year institutions recorded the first-ever drop (down 66,600, or 8.7%). The two classes of institutions showing the greatest growth are public four-year institutions (increased by 126,824 or 7.2%) and private non-profit four-year institutions (up by 86,811 or 12.7%). (Allen & Seaman, 2015, p.5)

Because of the combined prevalence and preference for of hybrid courses offered at the University of La Verne, and recognizing that the prediction and trend is for increased demand for online courses, the University of La Verne is grappling with how ascertain student satisfaction with the existing use of technology in the classroom, and, how to meet or exceed student expectations of excellence in education.

### **ECAR STUDY OF UNDERGRADUATE STUDENTS AND INFORMATION TECHNOLOGY**

An important measure of student satisfaction and expectations of the use of technology in the delivery of educational programs is the ECAR study of undergraduates (2015) which approaches the use of technology in learning environments within the framework of LMSs. It addresses mobile access (M-learning). Most interesting among the finding of the study are students preference (only 11.9 percent of University of La Verne students had a preference for any form of online component) for blended (use of distance technology and the Internet) courses, whether or not the course is a true distance course in a hybrid (online and face-to-face) learning environment as defined in the literature.

The study surveyed 75,000 students from 213 institutions among 15 countries. The response rate was 5%, which is not statistically significant (Miller & Salkind, 2002). Notwithstanding Gordon et al. found:

...as offered by Nulty (2008), in the context of education and teaching, when the objective is to obtain feedback, any return rate of surveys is important. Adequate response rates for research which can provide statistical significance are ideal, but, ‘...if even one response that provides information which can be used...the survey’s purpose has, at least in part, been served and the response rate is technically irrelevant....’ (2016)

One of the many benefits of the ECAR study is it provides the ability for institutions to compare (benchmark) participating institution’s students’ attitudes about the use of technology in learning environments with those specific to their own university. In this manner, findings which do not support the institution’s goals and objectives can be addressed through needs analysis and corrective action plans. Instrumental to continuous performance is the use of metrics and models for measuring performance. Performance indicators are a means of establishing measurable outcomes to established goals and objectives.

### **Performance Indicators**

The measure of the success of an organizational strategy is the comparison of the outcome of a specific activity to a goal as defined in a strategic plan to achieve the strategic goal (Eckerson, 2011). The measurement (metric) of the success of an organizational strategy is the comparison of the outcome to the goal, which is called a performance indicator. Organizations cannot effectively measure everything and therefore only a few “driver” (influencer) metrics are used to gauge performance outcomes and to guide corrective actions. These driver metrics are called “Key Performance Indicators” or, “KPIs”.

KPIs can measure an organization’s progress toward goal achievement. They should reflect an organization’s strategic vision, mission, goals, and objectives. Generally speaking there should be at least one KPI for each major activity.

KPIs in higher education are “...effective measures of the quality of the universities’ output based on their planning and performance improvement” (Muniandy, Ong, Phua, & Ong, 2011, p. 171). The Ministry of Higher Education, Malaysia, for example, provides institutions with benchmarks for KPIs and in this manner is able to monitor and provide feedback for improvement to achieve targeted goals. That being stated, few studies exist in higher education wherein institutions have successfully implemented the use of KPIs.

### **Balanced Scorecard**

Often associated with the use of KPIs are “scorecards”. In institutions of higher education (IHE) use of the balanced scorecard (BSC), which originated in the business sector in the 1990’s, was adapted as a model for viewing the achievement strategic goals through the use of KPIs. The balanced scorecard typically is broken into four quadrants: financial, customer, internal processes, and learning and growth (Brown, 2012).

Historically, even institutions in higher education which have attempted to use measurable indicators of performance have failed to include KPIs for subjective areas.

...relevance, accessibility, value added, appreciation of diversity, student satisfaction levels, and motivation for lifelong learning, yet a common mission of IHEs (Institutions of Higher Education) is to foster lifelong learning. Many of these indicators, especially those relating student and faculty expectations and satisfaction levels, deserve greater attention; recruiting, retaining, and nurturing the best and brightest individuals is the primary goal of IHEs (Ruben 1999). Despite this, the five most common performance-based measures used in higher education are retention and graduation rates, faculty teaching load, licensure test scores, two-to four-year transfers, and use of technology/distance learning (Burke, 1997).

As presented by Gordon, et al.:

The BSC concept was first introduced by Robert Kaplan and David Norton (1992) in the Harvard Business Review. The BSC provides a framework for linking strategy to value-creating processes. There are four quadrants: the financial, the customer, internal processes, and learning and growth. Financial refers to tangible outcomes, such as return on investment (ROI), shareholder value, profitability, and revenue growth. The customer refers to the intangible assets of values to a particular group (customers), such as quality, service, and delivery. The organization's internal processes refer to key critical processes impacting the organization's strategy, such as investment in research and development and compliance. Internal processes include operations, customer management, innovation, and regulatory and social processes (e.g., environment, safety and health, employment practices, and community investment). Learning and growth refer to intangible assets, such as key positions and systems supporting the value-creating internal processes in an aligned fashion. It was necessary to view the BSC in the context of the organization. Therefore the organization's vision and mission had to be aligned with strategies.... Kaplan is credited with noting: 'People can't manage what they can't measure, and they can't measure what they can't describe' (p. 388). (2013, pp).

Chen, Yang, and Shiau (2006) sought to apply the balanced scorecard to the performance of higher education. They identified the four measurement perspectives attributed to Kaplan and Norton (1996) as: (1) Financial perspective; (2) Customer perspective; (3) Internal process perspective; and, (4) Learning and growth perspective. However, as presented by Brown (2012) the performance measures utilized were quantitative rather than qualitative in nature. An important contribution made by Chen et al. (2006) was emphasizing that the mission and vision drive an organization's strategy, not the financial or shareholder objectives, citing Kaplan and Norton (2001).

This case study seeks to present an example of how to identify a key performance indicators (KPIs), in this case data from the ECAR study 2015, which impart a significant impact on achieving the University of La Verne's 20/20 Vision ("La Verne's 2020 Vision—A Strategic Plan," n.d.) for subjective goals such as student satisfaction and expectations.

As presented by Brown (2012) in discussing the use of performance indicators in higher education:

Absent from these common performance-based indicators are the measurement categories and specific model suggested by a BSC approach. IHEs need measureable indicators that reflect value and excellence achieved through investments in technology, innovation, students, faculty, and staff (Nefstead and Gillard 2006). Currently ranking systems in higher education consider the multiple facets of higher education but not offer guidance in the selection and organization of performance measures in terms of performance drivers of diagnostic indicators. Moreover, these ranking systems often do not relate performance indicators to the institution's mission or provide guidance toward continuous quality improvement (Beard 2009).

### **UNIVERSITY OF LA VERNE – EXAMPLE OF QUALITATIVE KPIS INCORPORATED WITHIN A BALANCED SCORECARD FRAMEWORK**

The University of La Verne's 2020 Strategic Vision and Strategic Initiatives, as published at [www.laverne.edu/2020vision](http://www.laverne.edu/2020vision), are characteristic of visions and mission statements at most institutions of higher education, as described in Brown's work, above. While each strategic initiative identified in the University of La Verne's strategic vision has at least one associated goal and objective, there are no published performance-based indicators of performance for the goals and objectives.

This paper seeks to present a hypothetical conceptual model with which to measure performance using key performance indicators and a balanced scorecard approach. The focus of the hypothetical example is the University of La Verne's strategic vision and strategic initiatives related to the use of technology in the delivery of educational programs.

The four core strategic initiatives and goals identified under the University of La Verne's Vision are:

- Achieving Educational Excellence
- Strengthening Human and Financial Resources
- Heightening Reputation, Visibility and Prominence
- Enhancing Facilities and Technology

While all four strategic initiatives and goals are interrelated and dependent on one another, for purposes of this case study the authors focus on a single initiative, achieving educational excellence, to demonstrate, by way of example, the hypothetical application of qualitative KPIS and the balanced score card conceptual frameworks.

Specific to the University of La Verne's Strategic Initiative I, Achieving Educational Excellence, is underlying Goal 7: Deliver courses face-to-face, hybrid or online to achieve excellence in student learning ("La Verne's 2020 Vision—A Strategic Plan," n.d.). The underlying objectives of Goal 7 are: (1) Develop an organizational model that supports systematic and collaborative online delivery, where appropriate; and, (2) Develop a technology-supported learning environment to

enhance student learning and faculty research and development. For purposes of this exercise, the development of the conceptual model only addresses objective one.

Adhering to the suggestions put forth by Brown (2012), this paper will align University of La Verne's students' qualitative feedback in terms of student expectations and satisfaction levels with key performance indicators from which to measure the achievement of stated goals and objectives regarding technology in the delivery of educational programs. Once key performance indicators have been identified and aligned with institutional goals and objectives and metrics (measurement of performance) established, the outcomes will be applied to a hypothetical balanced scorecard framework specific to the University of La Verne.

### **Step 1: Identify strategic goals and objectives**

As a first step, Brown (2012) suggests identifying and aligning strategies, goals, objectives and performance measures. To expand on and clarify the hypothetical example, the authors selected the published University of La Verne's 2020 Vision's Strategic Initiative I, Achieving Educational Excellence, and aligned it with Goal 7 which states: to deliver courses face-to-face, hybrid or online to achieve excellence in student learning ("La Verne's 2020 Vision—A Strategic Plan," n.d.). The underlying objectives for Goal 7 are: (1) Develop an organizational model that supports systematic and collaborative online delivery, where appropriate; and, (2) Develop a technology-supported learning environment to enhance student learning and faculty research and development. For purposes of this case study example, only objective one is developed within the conceptual model.

The University of La Verne's selected strategy was transferred into the framework of a Balanced Scorecard template, slightly modified from that developed by Brown (2012), as can be seen in Table 1. The authors enhanced Brown's model (2012) by adding goals and objectives to the framework so as to present a complete visual trail for the reader of the alignment, from a strategic initiative, to a goal, to an objective, with a defined KPI measure (metric), target performance outcome, frequency of measure, findings, and trending.

The published University of La Verne's strategic vision (strategies), goals, and objectives were not modified by the authors. The hypothetical example provided below presents the authors' view of possible KPI measures, targets, and frequency, focusing on meeting or exceeding University of La Verne undergraduate student satisfaction and expectations in the use of technology in the delivery of educational programs.

The outcomes (findings) of the KPI measure (metric) of qualitative student expectations and satisfaction are taken from the University of La Verne's benchmarking report (as a participating institution) of student responses to the published in the EDCAR 2014 survey (2015). In determining a "meets or exceeds" outcome, the measure of student responses were calculated by a combined value of the equivalents of "good" and "excellent" categories (i.e., equal to or greater than 50%).

STRATEGY	GOAL	OBJECTIVE	Consolidated KPI (MEASURE)	TARGET	FREQUENCY	FINDINGS	TRENDING
Strategic Initiative I: Achieve Educational Excellence	7. Deliver courses face-to-face, hybrid or online to achieve excellence in student learning	1. Develop an organizational model that supports systematic and collaborative online delivery, where appropriate; and	A. Increase undergraduate student expectations for collaborative online course delivery.	Increase undergraduate student expectations for collaborative online course delivery 10% in academic year 2016-2017 using EDCAR data	Annually		
			B. Increase undergraduate student satisfaction with collaborative online course delivery	Increase undergraduate student satisfaction for collaborative online course delivery by 20% in academic year 2016-2017 using EDCAR data	Annually		
		2. Develop a technology-supported learning environment to enhance student learning and faculty research and development  (Note: this Objective is not developed for purposes of the conceptual model)					

**Table 1: Balanced scorecard. (Adapted from Brown, 2012, Figure 1, pp. 45).**

**Step 2 – Development of Qualitative KPIs**

Once the strategy or strategic initiative has been identified, and goals and objectives identified, the metric or measure of performance must be constructed and a target identified from which to ascertain level of performance. Table 2, below, exemplifies one methodology for selecting, and if desired, weighting the importance of multiple data points (sub-KPIs) to consolidate into a single KPI (Table 1).

MEASURE	Sub-KPIs (ECAR 2015 Question No.*)	Univ. of La Verne (=>50%) Good or above % of Responses	DR private Institutions (=>50%) Good or above % of Responses	All US Institutions (=>50%) Good or above % of Responses	Weighted Factor	Univ. of La Verne Wt. Average	DR Private Institutions Wt. Avg.	All U.S. Institutions Wt. Avg.
<b>Increase under- graduate student expectations for collaborative online course delivery</b>								
	3.14.1 wish instructors used LMS	78.6	76.4	75.2	2	157.2	152.8	150.4
	3.14.2 Wish instructors use online collaboratio n	77.3	71.7	71.0	3	231.9	215.1	213.0
	3.14.7 Wish instructors used recorded lectures	71.3	75.4	72.9	1	71.3	75.4	72.9
	3.14.14 Wish instructors create videos	65.8	54.1	56.1	1	71.3	54.1	56.1
	3.14.17 Wish instructors use blogs, discussion, or collaboratio n tools re class work	58.7	54.9	56.1	2	117.4	109.8	112.2
	4.1 Preferred learning	88.1	86.3	88.8	1	88.1	86.3	88.8

MEASURE	Sub-KPIs (ECAR 2015 Question No.*)	Univ. of La Verne (=>50%) Good or above % of Responses	DR private Institutions (=>50%) Good or above % of Responses	All US Institutions (=>50%) Good or above % of Responses	Weighted Factor	Univ. of La Verne Wt. Average	DR Private Institutions Wt. Avg.	All U.S. Institutions Wt. Avg.
	environment some or all online							
<b>TOTALS</b>		<b>439.8/6= 73.30%</b>	<b>481.8/6= 69.80%</b>	<b>420.1/6= 70.22%</b>	<b>10</b>	<b>737.2/10= 73.72%</b>	<b>693.5/10= 69.35%</b>	<b>693.4/10= 69.34%</b>
<b>Increase under- graduate student satisfaction for collaborative online course delivery</b>								
	3.2.3 Wireless: reliable access in classroom or instructional spaces	45.1	58.2	59.9	4	180.4	232.8	239.6
	3.2.4 Wireless: ease of login	40.4	56.8	56.3	3	121.2	190.4	168.9
	3.2.5 Wireless network performance	37.0	41.3	45.7	4	148.0	165.2	182.8
	3.4.2 Handheld support- library	37.8	20.2	26.2	4	151.2	80.8	104.8
	3.4.2 Handheld support - course content	54.9	41.5	50.3	4	219.6	166.0	201.2
	3.4.4 Handheld support- LMS	47.5	38.6	44.5	4	190.0	154.4	178.0
	3.5.2 Handheld communicat ing with	69.4	62.4	61.4	4	277.6	249.6	245.6

MEASURE	Sub-KPIs (ECAR 2015 Question No.*)	Univ. of La Verne (=>50%) Good or above % of Responses	DR private Institutions (=>50%) Good or above % of Responses	All US Institutions (=>50%) Good or above % of Responses	Weighted Factor	Univ. of La Verne Wt. Average	DR Private Institutions Wt. Avg.	All U.S. Institutions Wt. Avg.
	other students							
	3.5.3 Handheld communicat ing with instructors	61.8	35.7	54.1	4	247.2	142.8	216.4
	3.5.11 Handheld participating in interactive class activities	38.2	21.5	31.9	4	152.8	86.0	127.9
	3.6.2 Instructors have adequate technical skills for course	31.5	28.0	33.4	4	126.0	112.0	133.6
	3.6.6 Instructors encourage online collaboratio n	35.3	42.7	55.7	3	105.9	128.1	167.1
	3.7.1 LMS usage	79.7	80.3	75.4	4	318.8	321.2	300.4
	3.7.6 Online collaboratio n tools	75.8	66.2	59.4	4	303.2	264.8	237.6
<b>TOTAL</b>		<b>617.4/13=47.49%</b>	<b>593.4/13=45.65%</b>	<b>654.2/13=50.32%</b>	<b>50</b>	<b>2541.9/50=50.84%</b>	<b>22741/50=45.48%</b>	<b>2503.9/50=50.08%</b>

\*Alpha-numeric operators added to root question number to distinguish separate subparts of a question

**Table 2: Development of KPIs based on sub-KPI data points from the results from ECAR Study of Students and Information Technology, 2015 (University of La Verne Benchmarking Report) factored into consolidated weighted averages for each metric (measure). (Adapted from Brown, 2012, Figure 1, pp. 45).**

### **Step 3 – Balanced Scorecard Performance Improvement Plan**

Brown (2012) asserts that IHEs generally fail to apply performance objectives to institutional performance outcomes. The conceptual model developed by Brown (2012) considers the limited work published on the topic inclusive of Cribb and Hogan 2003 and Mikhail 2004, both of which

originate from international perspectives. Brown identifies a handful of institutions in the U.S. that have undertaken the use of Balanced Scorecards, the largest system being that of the University of California campuses. She notes that for BSCs to be successful, IHEs will necessarily find it necessary to modify their framework to the particular institution’s profile and vision and mission. In the case of the University of La Verne, “Customers,” as an example were identified as “students.” Brown (2012) recommends including the “community” as a second classification of “Customer” in a higher education setting. For purposes of this demonstration, the authors chose to simplify the example by only addressing students.

As can be seen in Table 3, the balance scorecard extends the visual example from the development of KPIs for the University of La Verne for Goal 7, Objective 1A and 1B into the BSC template. Only the “Customer” element of the BSC is addressed in this case study due to the alignment of the BSC category with the institution’s specific goal, objective, and KPIs.

	SCORECARD	DEPARTMENTAL LEVEL	ACTION PLAN
FINANCE			
COMMUNITY			
A. Improve Student Satisfaction	Improve Student Satisfaction with online technology	100% of ____ department students report being satisfied with online technology used in the delivery of courses	<ol style="list-style-type: none"> <li>1) Evaluate courses with online technology components and align delivery with students’ satisfaction needs</li> <li>2) Identify prioritized action items to continuously make improvements toward goals, objectives, and target metrics</li> </ol>
B. Improve Student Expectations	Improve Student Expectations with online technology	100% of ____ department students report expectations met or exceeded with online technology used in the delivery of courses	<ol style="list-style-type: none"> <li>1) Evaluate courses with online technology components and align delivery with students’ expectations</li> <li>2) Identify prioritized action items to continuously make improvements toward goals, objectives, and target metrics</li> </ol>
INTERNAL PROCESSES			
LEARNING & GROWTH			

**Table 3: Balanced scorecard performance improvement plan. (Adapted from Brown, 2012, Figure 3, p.47).**

## METHODOLOGY

This study of the development of KPIs and a Balanced Scorecard to hypothetically improve the University of La Verne's accomplishment of strategic initiatives, goals and objectives is founded in the case study methodology. Using the published University of La Verne's Strategic Initiative I, Achieve Educational Excellence, and aligning Strategic Initiative I with underlying Goal 7, Deliver courses face-to-face, hybrid or online to achieve excellence in student learning, coupled with Objective 1 (develop an organizational model that supports systematic and collaborative online delivery, where appropriate) and Objective 2 (develop a technology-supported learning environment to enhance student learning and faculty research and development), underlying Goal 7, the authors hypothetically created a measures of performance (KPIs), target performance levels, frequency of assessment, findings, and trends (Step 1, Table 1). It should be noted that for purposes of this demonstration the authors focused only on Objective 1 and did not develop Objective 2.

The data used supporting student expectations and satisfaction with the use of Information Technology in the classroom was extracted from the benchmarking report provided to the University of La Verne resulting from its participation in the annual ECAR Study of Undergraduate Students and Information Technology (2015).

The authors then (Step 2) identified KPI measures of student expectations (KPI Measure A) and satisfaction (KPI Measure B) for each objective. In this conceptual model the authors utilized multiple data points identified as sub-KPIs (see Table 2). The outcomes (findings) of the KPI measures (metrics) of qualitative student expectations and satisfaction are taken from the University of La Verne's benchmarking report (as a participating institution) of student responses to the published in the EDCAR 2014 survey (2015). In determining a "meets or exceeds" outcome, the measure of student responses were calculated by a combined value of the equivalents of "good" and "excellent" categories (i.e., equal to or greater than 50%).

## ANALYSIS

### **Strategic Initiative I: Goal 7**

Strategic Initiative I states "Achieve Educational Excellence." This initiative is supported by Goal 7, which is to "Deliver courses face-to-face, hybrid or online to achieve excellence in student learning.

*Objective 1.* Underlying Goal 7 is Objective 1, which is to "Develop an organizational model that supports systematic and collaborative online delivery, where appropriate"; and Objective 2, below. The authors created the following KPI measure to determine performance levels for student expectations: Increase undergraduate student expectations for collaborative online course delivery. The associated Target performance level for the KPI measuring student expectations was "Increase undergraduate student expectations for collaborative online course delivery 10% in academic year 2016-2017 using EDCAR data from the University of La Verne's benchmarking report.

The authors created the following KPI measure to determine performance levels for student satisfaction: Increase undergraduate student satisfaction with collaborative online course delivery. The associated Target performance level for the KPI measuring student satisfaction was “Increase undergraduate student satisfaction for collaborative online course delivery by 10% in academic year 2016-2017 using EDCAR data. The basis for the baseline (first year of metric outcomes) was compiled (Step 2, Table 2) by selecting six pertinent 2015 EDCAR questions and response performance rates (KPIs), applying a weighted factor to each of the response performance rates, totaling the response rates both weighted and non-weighted, and dividing by the number of sub-KPIs (six in this example) to arrive at a performance outcome for each Objective’s consolidated KPI .

*Objective 2.* Underlying Goal 7 is Objective 1, above, and 2, which is to “Develop a technology-supported learning environment to enhance student learning and faculty research and development. For purposes of this study the authors only developed Objective 1, above.

## **FINDINGS**

Presently there can be no findings associated with the hypothetical KPIs established for the University of La Verne’s goals and objectives from which to measure outcomes against the hypothetical target performance outcomes until the University of La Verne’s benchmark report for the EDCAR 2015 survey (anticipated in 2016) is received and analyzed in the context of the conceptual model for Tables 1 and 2, above, to determine if target performance outcomes are achieved. The assessment of the difference between the KPI and the target will highlight areas of strengths or weakness. If weaknesses exist, they can be identified for corrective action and strengths exist, they can be reported as artifacts of achievement of University strategic initiatives.

## **RECOMMENDATIONS**

The initial steps necessary to establish a systematic process for identifying, assessing, correcting, and improving institutional performance exist at the University of La Verne. We have created a formal 2020 institutional Vision and Strategic Initiative document from which to begin to develop institution-wide KPIs and a BSC to guide the institution in meetings identifiable and measurable goals and objectives.

This case study of the University of La Verne sought to present a conceptual model of how IHE can design simple or complex (multiple and weighted) KPIs to measure achievement of institutional goals and objectives based on data points pertinent to those goals and objectives. Further, this case study sought to demonstrate the development of the more difficult qualitative types of performance, such as student satisfaction and student expectations.

Because of the narrow scope of this study (a limitation), full-development of all KPIs and elements of the BSC were not undertaken. Had all KPIs and elements of the BSC been developed, it is recommended by the authors and Brown (2012) to include a BSC strategy map. A strategy map will visually draw connections among the various elements of the BSC and identify causal relationships among the elements. A recommendation is for IHE to fully develop KPIs, a BSC

Strategy Map, and, a BSC Performance Improvement Plan to successfully manage continuous improvement of performance to objectives, aligned with institutional goals and objectives.

### CONCLUSION

This case study, using the Vision and Strategic Initiatives (goals) of the University of La Verne, provides a conceptual framework within which to develop KPIs to assess performance against target performance for the achievement of institutional goals and objectives in the utilization of Information Technology. The study utilizes key data points from the ECAR Study of Undergraduate Students and Information Technology published in 2015 to design multiple, weighted sub-KPIs which are combined to a single KPI for a select institutional Objective. The construct provides the means by which to measure annual attainment of target KPIs toward institutional goals. The model is presented within the framework of a Balanced Scorecard to achieve data-driven continuous improvement toward institutional strategic goals and objectives.

The significance of this study is two-fold. First, the examples provided in the case study focus on utilizing KPI, both simple and complex (multiple and weighted data points), and, secondly, this case study provides examples of KPIs for measuring performance against established targets for subjective, qualitative elements of institutional performance (e.g., satisfaction levels and expectations). A review of the literature reveals a very limited practice in IHE of using KPIs and BSC. This case study may serve as a template for other IHEs to develop their own KPIs and BSCs to not only improve their own institutional performance to goals and objectives, but to provide opportunities for institutional benchmarking in the utilization of Information Technology.

### REFERENCES

- Allen, E. & Seaman, J. (2015). Grade Level: Tracking Online Education in the United States. Higher Education Reports, retrieved from <http://www.onlinelearningsurvey.com/highered.html>
- Brown, C. (2012, July-September). Application of the balanced scorecard in higher education: Opportunities and Challenges. *Planning for Higher Education*, 40(4), 40-50.
- Chen, S. H., Yang, C. C., & Shiau, J. Y. (2006). The application of balanced scorecard in the performance evaluation of higher education. *The TQM Magazine*, 18(2), pp. 190-205
- Eckerson, W. (2011). Performance Dashboards: Measuring, Monitoring, and managing your Business. 2<sup>nd</sup> ed. John Wiley & Sons, Inc., New Jersey.
- Gordon, L., Gratz, E., Kung, D., & Moore, L. (2015). Utilization of Information Technology in Instructional Support in the Higher Education – A Case Study, Working paper, 2016.
- Hogan, H. W., & Muir, G. E. (1990). The University of La Verne -- A Centennial History: 1891-1991.
- Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard: Measures that drive performance, *Harvard Business Review*, 70, 7109.

Kaplan, R. S., & Norton, D. P. (1996). *The balanced scorecard: Translating strategy into action*, Harvard Business School Press, Boston, MA.

Kaplan, R. S., & Norton, D. P. (2001). *The Strategy-focused Organization: How balanced Scorecard Companies Thrive in the New business Environment*, Harvard Business School Press, Boston, MA.

La Verne's 2020 Vision—A Strategic Plan. Retrieved from University of La Verne, <http://laverne.edu/2020vision/>

Muniandy, B., Ong, M. Y., Phua, K. K., & Ong, S. L (2011, September). Assessing Key Performance Indicators Monitoring System (KPI-MS) of a university using technology acceptance model. *International Journal of Social Science and Humanity*, 1(3).

Rudestam, K. E., & Schoenholtz, J. (2010). *Handbook of Online Learning*. Kjell Erik Rudestam and Judith Schoenholtz-Read (Ed.). 2<sup>nd</sup> ed., Sage Publications Inc., Los Angeles.

University of La Verne (2016). *University of La Verne Factbook 2011 - 2015*. Retrieved from <http://sites.laverne.edu/institutional-research/files/2011/10/Factbook-2011-2015-022416.pdf>