

## Review

# Leading in a technological age

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**Technology is advancing more rapidly than at any time in history since the beginning of the Industrial Revolution. In fact, experts say that the world is leaving the Industrial Age of the 20th century and entering an Information Age that will lead into the future. These advances mean that important changes are being made in all areas of life – and academia is no exception. This paper discusses the ramifications of technological advancement on higher education in terms of content and delivery of coursework. Elements discussed were continuing education and technical support for faculty and staff; new ways to engage students – especially in online environments – including learning communities; and the transformation of college campuses to technological arenas, and in some cases virtual environments. Especially important is the discussion of leadership: What it will take to facilitate the changes required; how to keep staff members and students motivated through the transition; and who will be responsible for making the changes – as well as how they will be held accountable.**

**Key words:** Technology, leadership, online learning, higher education, distance education programs.

## INTRODUCTION

Technology is rapidly advancing; and that is consistently creating changes in the way people and organizations function, access information and communicate. As capabilities increase, institutions of higher learning are attempting to utilize the new technology. Admittedly, in the beginning usage was severely limited. In fact, it was primarily used as logistical support to conventional instruction; such as preparing lecture notes and overhead transparencies, sending e-mail messages, developing colorful classroom presentations and otherwise replacing the typewrite and blackboard (Cohen, 1998). As time progresses, the wave of technology sweeping through educational institutions has made it imperative to implement fundamental changes in the roles of faculty and administration; changes that mean educators and students need to learn new and effective ways to utilize the technology. Much of what is believed about education and the delivery of information is changing; and educators keep up with these changes. Technology is causing changes in the work- and course-loads; which lead to continuing education, curriculum development and technical support issues for faculty and staff members.

These changes are affecting students as well. Online classes are different in almost every way from traditional classroom settings, making engagement and retention primary concerns. "Complete online degree programs are now offered by 34% of institutions of higher education in

the U.S. (United States – sic)" (Santilli and Beck, 2005) and attrition numbers are escalating. Educators must fight this attrition by finding new ways to provide high-quality support services to both traditional and online students (Floyd and Casey-Powell, 2004); helping them to succeed in this new environment.

Major changes are also needed in the areas of admissions; registration and financial aid; career and academic counseling; as well as library and research services. In addition to the technological advances, financial concerns are playing a major role in the changes taking place. Eddy and VanDerLinden (2006) says that currently higher education is being shaped by declining resources, changing student demographics and the overall shift from the industrial age to the information age. There is no doubt that the face of the American college and university is changing due to technological advances. There is also no doubt that it is going to take strong leadership to make these changes advantageous and keep the institutions of higher learning running smoothly.

## FACULTY AND STAFF

American higher education and distance education programs are on the rise (DiRamio and Wolverton, 2006; Santilli and Beck, 2005); and, in fact, it is estimated that by 2010 or sooner students will assume that any course

they wish to take can be taken online (Lynch et al., 2002). No one is insinuating that traditional classrooms will disappear; however, these technologies will be available as alternatives for students looking for flexible means to become educated.

Successful implementation of distance learning programs necessitates faculty that can understand and work within an online environment. Part of the problem is that educators are faced with an unfamiliar scenario and a definite power shift because in many cases students are more technologically savvy than instructors. Together with the estimates of widespread change, this means continuing education is a must for anyone intending to teach within higher education. Research shows that in most universities and colleges only a small number of faculty members have experience with online-learning pedagogies (Lynch et al., 2002) and that, because of this, educators must be willing to become learners again in addition to being instructors (Lynch et al., 2002; Floyd and Casey-Powell, 2006; McGriff, 2001). They also point out that for those who are willing there are a multitude of workshops and seminars available on web design software and online delivery systems. These programs are terrific for the professor who is already technologically savvy or just wants to post a syllabus or create a discussion group within a traditional class. But, there is more to the change than creating an attractive web page.

Current and future technology means that faculty and staff members need to rethink key aspects of education. In fact DiRamio and Wolverton (2006) suggest a complete shift in pedagogical philosophy; and believe that professors must become designers of learning experiences as opposed to simple teachers. Even in traditional classroom settings, students' needs are demanding instructors to create more elaborate material and be available to answer questions electronically (and in less time than previously expected). A simple 45 minute lecture followed by a question and answer session will no longer suffice as 'classroom preparation'. Much of the time, instructors will not see their students face-to-face during the course of an entire term; and therefore can no longer assume that a handful of students will sit in on their lectures. Educators will increasingly be presenting through electronic media so that as many students as possible can be engaged (Cohen, 1998). The instructor who is interested in creating a virtual chemistry laboratory or a scenario in which online students can listen in on a classroom lecture in real-time will need time – maybe even reduced teaching loads; and technical support – perhaps a campus technology center that includes faculty development segments on these subjects.

There is much agreement among researchers (DiRamio and Wolverton, 2006; Floyd and Casey-Powell, 2004; Lynch et al., 2002; Nworie and McGriff, 2001) that the success of applying technology to higher education rests squarely on the shoulders of the faculty members. Unfortunately, these faculty members cannot apply technology they do not understand; nor can they implement change on their own. There must be more effort made by the faculty member to learn; but there

must also be effort made by the campus to offer technical support. Floyd and Casey-Powell (2004) study showed that campuses whose culture supported online programs encouraged meaningful interaction between students, professors and technical support personnel.

Information-technology experts on college campuses agree that helping faculty members integrate technology into their instruction is the single most important issue they face in the near future. They also indicate that staff members have unreasonable expectations about the technological support they should receive (Lynch et al., 2002). Additionally, they do not believe faculty members are making a conscious effort to incorporate technology in meaningful ways into their curriculum. On the other hand, in her study on faculty development, VanDerLinden (2005) says that through professional development programs faculty and staff can learn more quickly; campuses need only provide an organized, focused forum for developing specific skills needed to solve institutional problems.

Clearly, technological advances have made quite a difference in the job of teachers within higher education. In fact, technology raises many issues in faculty development, curriculum development and technical support that cannot be addressed by the faculty members alone. Guidance and leadership will be the keys to successful transformation from industrial to information age education.

## **STUDENTS: ENGAGEMENT AND RETENTION**

In this age of rapidly expanding technology, it is becoming ever more important to earn a college degree in order to succeed in any professional field; and so, colleges and universities are seeing more and different students applying than ever before. Student numbers are increasing – as are class sizes – and student profiles are changing as well. When coupling these new profiles with the increase of distance education programs, college campuses are seeing varied technology skill levels. On average though, today's students are more technologically savvy than those of previous generations; and more than their instructors. McGriff (2001) tells us that student "expectations for technology-enhanced, practical, collaborative, real-world learning environments" are not being met by educational programs in which a majority of faculty members still depend on lectures as their primary method of teaching. Experts agree that if educators continue teaching the same way they always have, they will lose the interest of this new brand of student.

For a time it appeared that higher education institutions were on the right track. As early as 1997 a survey of campuses across the country found that one-third of all colleges' courses used e-mail, one-fourth used the internet and that two-fifths required computer competency within the core curriculum for undergraduates (Cohen, 1998). Unfortunately, technological advancement seems to have stagnated at that level for the most part. Cohen pointed out that as

early as 1995 one-third of all colleges and universities in the U.S. were offering 'distance education' courses – students participated in these courses primarily through two-way interactive video, one-way prerecorded video and other computer technologies. On the other hand, as late as 2006, it was said that more than one-third of college instructors still did not use technology in their courses (not even e-mail to communicate with their students).

Online education is becoming more important to students with each semester that passes; because as in every other aspect of life in America, finance is also becoming more of a challenge. Cohen (1998) says that "The pleasurable experience of being in a campus environment has already become too expensive for most". Higher education has reached an age when faculty members are facilitators for students following their own specific path through academia. During the contemporary era of higher education, only technology based programs are on the upswing; and Cohen tells readers that this vision is being caught by institutions in every state, region and consortia. Students are demanding technology and institutions that cannot provide any will fall by the wayside.

A campus culture that is inclusive of online students will include technical support to the faculty but also to the students. There may be some faculty members who are not comfortable working with students online; or students uncomfortable with seeking out additional support when faced with online assignments, discussion boards and peer critiques. The Higher Education Research Institute at the University of California Los Angeles (UCLA) conducted studies on the topic (Lynch et al., 2002) and found that a number of faculty and students willing – even eager – to invest time in adding technology to their instructional activities often cannot find adequate institutional support and recognition of their efforts. One thing that often appears in the literature is an agreement that online education demands much more time than do traditional face-to-face classes (Santilli and Beck, 2005).

In addition to creating degree programs for students who will not reside (or even study) on campus, educators must now consider that students in online environments do not have the same access to campus amenities and activities as traditional students; and that this may eventually lead to retention issues and other barriers to student success. DiRamio and Wolverton (2006), Eddy and VanDerLinden (2006), Floyd and Casey-Powell (2004) and Lynch et al. (2002) studies all show that online students have higher attrition rates than traditional students. DiRamio and Wolverton write that these students report a sense of isolation and remoteness. It stands to reason that learning communities might be a good fit in this environment.

On the whole, learning communities came about as an answer to incoming freshmen students who – for whatever reason – drop out of school due to lack of support or negative experiences during those all important first semesters. DiRamio and Wolverton (2006) suggest that this same system of community should be applied to online students in an effort to alleviate some of

the isolation they encounter. Creating a community in cyberspace is not necessarily an easy thing to do. But a sense of community can help a student feel as though he belongs; and that sense of belonging is important in reducing attrition rates. Students who feel valued and encouraged do better in every instance than those who feel isolated; therefore, the key to student success is to create communities in which online students have the same support systems available to them as traditional students. The DRC Group (2007) published an article on student services in new online environments. The consensus was that a.) Improvements are needed in curriculum and program development; b.) Student retention is a problem; and c.) There is a need for enrollment management. These are all areas which have been dealt with ad nauseam in traditional educational settings.

With regard to the subject of student services, Floyd and Casey-Powell (2004) points out that many students are spending virtually no time at all on campuses. They add that because of the growth of distance learning programs Student Services administrators have the burden of finding new ways to provide high-quality support services to both traditional and distance learners. From the admissions and financial aid process to the academic counseling and registration services, from library and research services to career counseling, distance learners have the same needs as traditional students – and therefore they must have the same student support services available if they are to succeed.

Many students who make the choice to take online classes or even to enroll in a virtual program or university are ambitious self-starters who are well on their way to academic success. Unfortunately, as many students currently enrolled in online courses have done so because they believe online classes to be easier, or to take less time; and mean the student need not attend classes. Whichever group a student belongs to, the online environment produces certain needs and issues; these needs must be met and these issues must be addressed – even if the student is unaware of them. This leaves it up to the academic leaders of today – and of tomorrow – to create programs and incentives that make online learning possible and productive; in fact the DRC Group's (2007) study says student engagement is the most prevalent theme on college campuses today.

## **CAMPUS MANAGEMENT**

New technology has led to a marked rise in distance education programs in colleges and universities across the United States. Much has been made of the race to obtain students outside of the campus community with the promise of certification and degree programs in a 'Virtual University' environment. In fact, DiRamio and Wolverton (2006) point out that in the year 2000 one expert predicted that information technology could one day make traditional brick-and-mortar universities obsolete. It has been widely supposed that the tuition from distance education programs is the only way to fund

the new technology needed to stay relevant in the marketplace. This being the case, there is necessarily a great push toward creating viable online programs quickly and recruiting students for the virtual university environments. In this push, students have become more customer than anything else – quality of education has been an afterthought at best; little attention is given to what is actually going on inside the online classroom.

In today's university, the dream classroom merges brick and mortar with technology. Curriculum and course delivery must be multifunctional and flexible – flexible in terms of space and in terms of future leanings further toward technology. Educators are looking toward ways to meld their online programs with their traditional classes – the hybrid classroom is the wave of the future. Unfortunately, none of this change is easy; nothing can be done quickly. Campuses must be prepared – and then people must be prepared. Unfortunately, as Lynch et al. (2002) says higher education institutions have been so preoccupied with the scramble for position in the marketplace of distance education that administrators have spent little time or energy on the vital task of preparing their faculties and staffs for the information age.

To truly integrate virtual and traditional classrooms, important changes must be made; there is a great need for training and development in order for students to be able to utilize these new technologies – let alone the faculty members. The DRC Group (2007) noted that campus management was a big concern for academic leaders – especially in terms of faculty and staff issues. Questions arise as to the possibility of retraining faculty and staff members to work within this new environment; issues of accountability and commitment come up. The DRC study indicated that concerns include communicating a vision across the campus, getting faculty and staff on board with the changes, keeping morale up through the process, and putting efficient and productive systems in place quickly. More than anything, it is important to recognize that a virtual classroom is not simply a change in geography for the student. Course delivery methods must necessarily be modified for the online environment, as must assignments and assessment methods.

The notion of getting faculty and staff on board and keeping them there is a difficult one. More than setting up a series of seminars and meetings which faculty members must attend at the start of a term, what is needed is a permanent technology support system. "A technology plan should include three basic elements: Firstly, helping faculty members use technology to redesign their courses and create new ones; secondly, incorporating technology into classrooms; and thirdly, improving the campus's technological infrastructure" (Lynch, 2002). To do it correctly, things should be done in that order – unfortunately, that is not the method utilized in colleges or universities in today's market.

Many of the senior staff members at universities across the country have been teaching for twenty years or more, and have set designs for their courses and their delivery. It will not be easy, nor will it be quick, to change their

habits and get them to understand the differences necessitated by the distance element of distance education. Perhaps the most difficult element to master is the creation of community in a virtual classroom. Just like in a traditional classroom, it is necessary to create bonds between students taking a course; and to make course materials interesting as well as educational. Currently information technology officers note that faculty members are not prepared to use technology as a resource; nor are they eager to learn new methods of teaching their courses – and, naturally, the more senior the instructor, the more difficult the process of changing to an online format (Lynch et al., 2002). There are institutions that train or at least consult with their faculties on software and hardware – some even supply focused training and support. At Cornell University, for example, over fifteen hundred individual undergraduate courses have active websites as part of the curriculum (McGriff, 2006). That being the case, fully integrated online courses seem to be making headway – and students are losing interest in what they believe to be antiquated teaching methods.

Teams need to be initiated to create online curriculum. The size and make-up of individual teams will depend on the complexity of the projected curriculum changes; but might consist of an instructor, a graphic artist, a videographer and an instructional designer who have the tools and technical knowledge to realize that instructor's vision. Any team creating courses for distance education courses should also include web programmers (Lynch et al., 2002). If possible, library staff members should also be part of the team (if only peripherally) to assist instructors in finding web resources useful to their course design. Copyright laws must be adhered to at all times; and often they are more restrictive for material put online than material used within a traditional classroom. Lynch says that at many institutions the library staff members are responsible for checking the copyright status of material that a professor wants to use and getting permission when necessary.

Curriculum is not the only aspect of campus life that must be reformulated for the online university. All areas of campus support must be included in the change: Admissions, advising, registration, financial aid, career services, counseling and library (research) services must all be considered. Floyd and Casey-Powell (2004) point out that these areas must also be reframed incorporating strategies for meeting the needs of these technologically oriented students. This, like curriculum development, will require professional development and in-service training for staff members across campuses. This training must include elements of the technology as well as an understanding of this new student population. According to Floyd and Casey-Powell (2004), the key to successful implementation of 21st century student support services is a complete redefining of traditional student services to include all students – traditional or online. Student services have always played a major role in the academe – now that an academic advisor or financial aid counselor may be the only contact a student has with a living, breathing person, it is all the more crucial to student success. Colleges are challenged to find new ways to

provide high-quality support services; and must ensure that all student service programs are meeting the needs of distance learners as well as the traditional student.

The two other issues that are coming up are accreditation and funding. New priorities and limits have been set by accrediting bodies; and universities must ensure that any and all online programs meet the requirements or all is done for naught. In addition, if a campus is not willing to commit funds to distance education and other technology needs, then it will not be possible to develop technology or any programs stemming from it. Technology, like mortgage payments and utility bills must become part of the permanent budget. Of course, there are many one-time costs that greatly affect a campus's ability to use technology. It usually costs at least \$175,000 for the equipment to make a classroom for 30 students fully interactive. Every group of five classrooms of that sort also requires a technician to maintain them and to be on site whenever any of the rooms is used, in case problems arise with the equipment (Lynch et al., 2002).

On the other hand, technology can bring in a great deal of money to a university as well; partially because the online instructional trend is resulting in the ability to deliver courses and programs to more students while reducing costs to institutions (Santilli and Beck, 2005). This increase in student numbers is allowing for greater overall profit to the university. These profits can be put back into the university through more classroom technology; as well as by funding staff development and in-service training programs. Companies have sprouted up across the country for just such training. The Faculty Online Technology Training Consortium was one of such companies – which began training in 2001 – and offers a nine-day training program for faculty on how to teach in a virtual classroom; among other things (Young, 2001).

Clearly, there is a lot to do in the management of a campus transforming itself into a digital environment. There is more to electronic pedagogy than fancy software packages or simple course conversion. Skills must be developed – especially community building skills – in order to maximize the benefits and potential the medium holds in the educational arena (Santilli and Beck, 2005). But given the possible rewards of the transformation, much more research and effort must be committed to finding the best process and procedures to follow. It is going to take strong leadership within departments to facilitate the curriculum changes and to keep staff motivated. It is going to take even stronger leadership at the university level to keep the process rolling. Technology is here to stay; university leaders need to bring their campuses into the information age sooner rather than later, leading through change.

More and more higher education institutions, especially private universities, are expanding online course offerings. In many of these institutions the technology has not kept up with the expansion – often because of funding and staff issues; but mainly because administrators have not set initiatives and incentives in place for these elements of change. In fact, as Lynch (2002) says in many ways the higher education culture is

indifferent (or even hostile) to making significant use of technology. The fact is that it may be even more problematic than simple indifference; McGriff (2001) notes that antiquated thinking within administrative units leads to the belief that the tradition of knowledge creation and transmission can be transformed by simply substituting digital for analog technology. Without strong leadership, institutions will resist change; remain a part of the industrial age; and fall by the wayside. "Institutions that have lost their capacity to adapt pay a heavy price. Yet the impulse of most leaders is much the same as it was a thousand years ago: Accept the system as it is and lead it" (Gardner, 1990).

Institutions as well as individuals are rethinking leadership roles – no longer is leadership a formal role to which one must be appointed (Eddy and VanDerLinden, 2005). This means that leadership training is critical at this time; and, as Eddy and VanDerLinden have discussed, colleges and universities are devoting valuable resources to sending staff members to leadership training workshops and programs – like the Future Leaders Institute – which focus on objectives such as instilling skills, knowledge and attitudes necessary for successful leadership. A key element seems to be that a leader need no longer be someone officially designated as head of a department, college or campus. Leadership instead, as Ramsden (1998) says is about mobilizing, motivating and inspiring people; and is no longer about individuals occupying formal positions within an organization.

Not only are parameters changing; out of necessity, leadership styles are also changing. It is true that organizations need to change their structures; but the leaders within those organizations also need to change their focus and avoid relying on history when making decisions. This is a time of great change; and experts agree that transformational leadership is the best form of leadership for times of change; and therefore should be used in learning organizations (Cohen, 1998; Ramsden, 1998). Transformational or transformative leaders have strong value systems and tend to stand by them under all circumstances. They also value people as individuals as well as in their capacity as teammates; and so they believe in teamwork and share the decision making process. Most of all, these are people who have a vision of what their department or college can be; and they are motivated and understand how to motivate others to reach that vision.

Leadership paradigms have changed with respect to instructional development, faculty development and student services; among other things. Most of this change is due to the technological changes taking place in the system and throughout the country. Even so, if leaders are to truly make strides, they must heed the words of Gardner (1990) who cautions that continual renewal is necessary for existence; and that good leaders understand how and why the process is needed. In other words, it is up to the educational leaders to understand the changes taking place with regard to technology and its use in order to guide the organizations and institutions which they lead into this new arena. As Nworie and McGriff

(2001) point out, "Leaders in educational institutions need to understand the change process in order to effectively lead and efficiently manage the transformation currently underway. Leaders of educational institutions must understand the process of change in order to effectively lead and efficiently manage their organizations through the change currently taking place."

Strong leaders are individuals who have a proven track record of success within their field and organization; people who understand the oddities of academia; and – obviously, under the circumstances – people who support the role technology is now playing within academia. In addition to this, universities need to be led by individuals who are already 'walking the walk'; and not just 'talking the talk' of technological integration. Nworie and McGriff (2001) say that having a clear vision of how the innovation can be adapted to produce the maximum benefit for the organization. Whether or not one is in the official position to facilitate, someone – a strong leader – needs to step up and take a leadership position in this time of change.

In essence, it all comes down to creating a system that ensures accountability. There are many ways to accomplish this, and several are discussed in the Gardner (1990) text. A strategy that seems to be effective in academia is the dispersion of power; in which power is broken up and spread around; keeping it from becoming too concentrated in one place. Inherent within this type of system is a set of checks and balances that serve as monitoring systems against abuse of power. Gardner says that power must be held accountable to someone, somehow. In the university system leaders are held accountable to shareholders including benefactors, state and local authorities and accrediting agencies; but most of all, must be held accountable for actions to the students. Bolman and Deal (2003) points out that pinpointing individual areas of responsibility is critical; as is good coordination of effort. Good leaders can accomplish this with little fallout, and at the same time find ways to hold themselves and the entire department or campus collectively accountable by creating a sense of team or family – because, as Bolman and Deal point out, when people work as teams, they share a common purpose and approach; and inevitably each member will hold him- or herself individually responsible for the successes or failures of the group.

Leadership is the key to the successful transition from the industrial model university to the information age university. Leadership, as opposed to management, consists of establishing direction and motivating people to do what is needed. It is about doing the right thing even when it is not the easiest thing to do. According to Muhammad (2002) educational leaders in this age will need to have good communication skills, be expert managers and will have great knowledge of the systems they are leading. This knowledge is critical because leaders of tomorrow will face issues that were non-existent just a few years ago. They will be dealing with the globalization of education due to distance education programs; the advent of virtual classrooms and colleges; and vast changes in accreditation requirements for higher

education institutions. The new leader for higher education will, according to Muhammad, need a strong knowledge of the collegial model of leadership as well as the ability to motivate and empower colleagues, board members, administrative staff, business advisors and others. Additionally, this person will need to build trust and have respect for differences in students' cultures and learning styles. Most importantly, in this time of great change and growth, leaders must have the strength to resist old demands for central control over colleges and universities; and instead be willing to delegate responsibilities and duties to trustworthy colleagues rather than attempting to micromanage everything.

## CONCLUSION

The 21st century college campus is a place of massive change; much of it due to technology. It is clear that technology creates changes in the way people and organizations function, access information and communicate. This is good for everyone involved. However, technology also raises many troubling issues; most obviously the fact that it takes time, effort and money to implement any new technology. According to the Higher Education Research Institute at UCLA, technology is a major source of stress for the majority of faculty and staff within higher education (Lynch et al., 2002). Regardless, technology cannot and will not be ignored. For an institute of higher learning to succeed it must have a technology plan in effect, and that plan should include three basic elements: A plan for faculty and staff instruction and development with regard to use of the technology; a way to incorporate the technology into the curriculum and the classroom; and a way to support the student body through the technological change.

What is critical to all concerned is that technological advancement is more than hardware and software; this is an entirely new method of information disbursement. Education will be handled differently from this day forward; at the same time it is crucial to understand that this is not simply a matter of faculty and staff training alone. Thinking like this tends to put all the impetus for change on the faculty; and this issue is not a problem of errant faculty that must be fixed – it is one of antiquated systems that must be updated and modernized. It is true that instructors must find new ways to engage their students (especially their online students); but it is also true that curriculum development on the whole must be reviewed and revamped so that instructors and students have the best available information to work with. If educators cannot engage students, they cannot retain them; and the students cannot graduate and become productive citizens in their own right. Educators must never forget that the main goal of any educational institution is to graduate its students.

In addition, it is imperative that Student Service leadership makes student engagement one of their top priorities.

Eddy and VanDerLinden (2006) met with many

instructors and administrators and found that they all shared common ground with respect to four areas: 1.) Admitting and graduating a diverse group of students and providing a quality educational experience; 2.) having a clear plan for measuring progress – a good assessment program in place; 3.) establishing strong communication and shared goals campus-wide; and 4.) finding new and increased funding and revenue to pay for the new technology and the programs stemming from it. Student support services must change to incorporate distance learners and other online students; and this will require training in those departments as well. It is important to remember that – although they are professionals in their respective fields – many student service professionals are not experts in online delivery methods; most of them likely have no training at all in this area.

Ramsden (1998) says that educators are working in difficult times of great change; and things do not appear to be getting easier any time soon. Clearly, all of this change is going to take strong leadership. New paradigms are being considered and in some cases implemented – transformational leadership is taking the place of transactional leadership in many institutions. More than a leadership style, though, is the need for leaders who are skilled in evaluating and synthesizing all of the variables involved in a given situation to come up with a viable plan of action.

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