

Six Steps to Invest in Humanware to Achieve Technology Integration

by Fred W. Scott, M.A.

How can we make a difference with student achievement and learning using technology? This stalwart question is what our national, state and local governments, societies, and school divisions are asking. A North Central Regional Educational Laboratory (NCREL) article about using technology to improve student achievement states,

...most research on technology and student achievement has used traditional standardized assessments to measure changes in student performance. This research often has focused on students' knowledge of isolated facts but has paid little attention to how well students think. Much has been learned in the last 15 years about new and meaningful ways to measure what students know and how well they know it. (Honey, 1999, ¶14)

Have the efforts of the past decade of procuring the hardware and software in schools contributed to sufficient change in student achievement? Are we really seeing a paradigm shift in the delivery of instruction, staff development, school leadership, and student performance assessments? School technology departments across our country have been investigating various strategies to answer these rich questions.

To make a difference with student achievement and instructional strategies using technology, the answer is straightforward. We must invest in humanware (teachers, administrators, other personnel). All districts and schools should provide staff development opportunities focusing on instructional and leadership strategies. Our ultimate goal is to prepare all students for the global digital society and to yield productive, marketable, competitive, and imaginative human beings. If the humanware is to mold and inculcate our future generations, it is vital that we give humanware the tools and strategies to help our students succeed.

My definition of humanware is investing in peoples' learning and integrating tools to explore the use of instruction to enrich specific goals and tasks. Let's delve into unique strategies that would make investing in humanware essential for making a difference with student achievement and technology integration. These strategies will answer the five W's of staff development training: who, what, when, where, and why.

Anyone planning to invest money in the stock market would take apt steps to invest his or her capital wisely. Commensurate with investing in the stock market is the need to invest in the technological growth of instructional and support staffs who must also meet certain criteria. The investment must be made wisely, efficiently, effectively, and economically, and its value and growth potential must be assessed. This investment aligned with curriculum

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blueprints, school improvement, professional development, and technology master plans ensure success for all students and communities, as noted in a report by the American Federation of Teachers (2005);

A school system's most important asset is its teaching force. And, the most important investment a school board, administrators, and parents can make in a school system is to ensure that teachers continue to learn. Continuous, high-quality professional development is essential to the nation's goal of high standards of learning for every child. (¶ 1)

View teachers, administrators, and support personnel as an investment for technology success. We will be exploring ways that investing in humanware can ensure the success of technology integration through defined steps that will ultimately heighten student achievement. One can view this analogy as an instructional guide for a school, department, district or any other entity that involves developing a staff development plan for student learning.

Let's examine specific steps for investing fully in the humanware of any organization, department, district or school:

1. Define objectives
2. Determine a time span
3. Set the risk level
4. Select the contribution method
5. Provide high-quality training
6. Choose the right method

1) Define objectives

In formulating technology integration objectives for investment it is fundamental to look at what one wants to achieve as the end result. Stephen Covey (1991) tells the reader to begin with the end in mind. Is this possible or feasible with humanware? Is there ever an end? Remember, whatever the vision, mission, and project, there are desired outcomes and the objectives should be specific and clear about what should take place. Make sure the audience for whom the objectives are formulated and the integration skills that will be trained and modeled. Construct "SMART" objectives (Plymouth GP Tutors, 2003; Figure 1).

Planning the objectives for humanware should follow each SMART concept for success. All objectives should focus on the investment targeted and what improvements are needed for student success. Humanware objectives should incorporate the context, process, and context standards outlined by the National Staff Development Council (NSDC, 2001) and the International Society for Technology in Education (ISTE, 2000-2004) standards for teachers and students.

The ABCD method of writing objectives is an outstanding starting point for writing curriculum or technology staff development objectives. Remember to incorporate Bloom's Taxonomy for the different levels of learning (Bailey, 2002).

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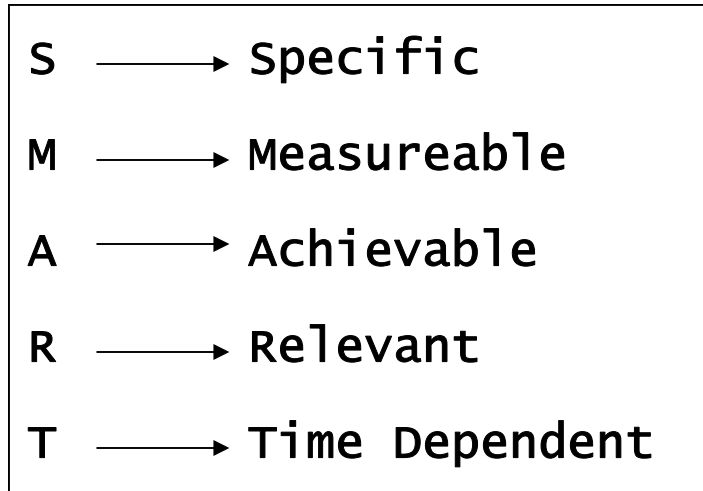


Figure 1. "SMART" Objectives (Plymouth GP Tutors, 2003).

Example Scenario: *The John Orlando High School has been selected by the School Board to receive laptops for all teachers and students. The school's planning team, consisting of the administrators, central office support leaders, instructional technologists, teachers, parents, and students were organized by the principal to begin to develop an implementation plan for the use of laptops at the high school level. The principal, technology director, curriculum director, and teacher (chairperson of technology team) led the planning in two exercises. They assisted the group in writing benchmarks for students and teachers and aligned the benchmarks with the curriculum objectives. Each objective listed how it would be measured, what evidence would show the achievement, and cross-walked with state and national technology standards. The John Orlando High School planning team developed a timeline in a table to identify when each objective would be implemented and measured through observations, student projects, and online surveys.*

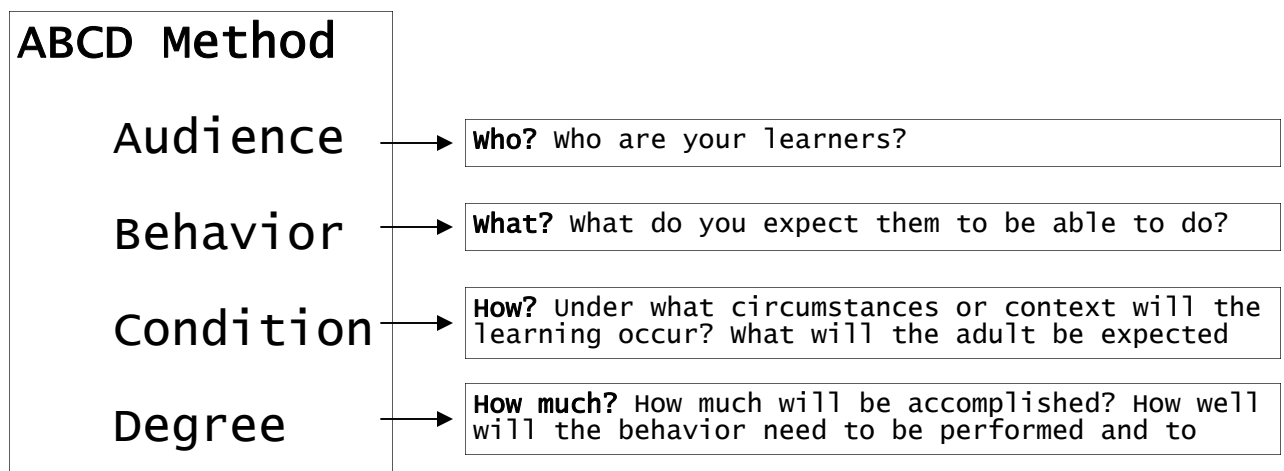


Figure 2. ABCD method of writing objectives (Bailey, 2002).

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2) Determine the time span

Now that the technology integration objectives are concrete and clearly focused on what the humanware should accomplish, decide when the time span for the training will take place. When investing in the stock market, people begin with a time span: *long, medium or short term* (Table 1). So what does this mean in planning strategies and implementation plans? First, let's explain the terms in order to determine how to handle the investment.

Long-Term investing means striving for small gains to achieve a large return. The staff development time frame is up to three years. The staff development rate of return equals each objective implemented in a comprehensive and well-defined process with yearly analysis of evaluations and empirical data with bi-yearly benchmarks. Direct results should correlate with student learning outcomes and outlined technology staff development activities.

Medium Term investing means striving for moderate gains to achieve a moderate or large return. The staff development timeframe is up to two years. The staff development rate of return equals a group of objectives identified and implemented with logical assertive strategies and benchmarks that are flexible with quarterly assessments. Direct results should correlate with student learning outcomes and outlined technology staff development activities.

Short Term investing means striving for immediate gains to achieve a direct, small, yet effective, return. The staff development timeframe is up to one year. The staff development rate of return equals an objective implemented with an aggressive approach and ongoing, immediate assessments. Direct results should correlate with student learning outcomes and outlined technology staff development activities.

Establishing the appropriate time frame falls back to the objectives and *when* the results are needed for improvement.

Example Scenario: Martha Dallas Elementary School's principal has decided to make a change in how the teachers will integrate technology into instruction. As a high-performing school on state and national assessments, for years the teachers have been mainly teaching the required content in the classrooms, and the computer lab teacher did all technology lessons with the students. The principal wants a new model put into action within a one-year time span. The immediate goal is to change the instructional delivery of the teachers to do the technology integration lessons with the students. The future goal is to enhance instruction through the use of technology to promote expeditionary/ project based learning. The school started off with a short-term plan to meet 25% of its School Improvement Plan objectives with a one-year time span to execute the plan.

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| Type | Timeframe | School or District's Improvement Plan Objective Percentage | Reform Strategy |
|-------------|--------------|--|---------------------------|
| LONG TERM | 2 to 3 years | 90 - 100% | Extensive reform |
| MEDIUM TERM | 1 to 2 years | 50 - 75% | Moderate, Flexible reform |
| SHORT TERM | Up to 1 year | 1 - 25% | Brief, Finite reform |

Table 1. Determining the time span

3) Set the risk level

Now that the technology integration objectives and the timeline have been established, the next step is the target audience and the risk level of implementation. It is critical at this stage that the plan for training addresses *who* is being trained and *what* risk level should be implemented. The risk level involves the degree of the implementation from the staff development or the improvement plan (Figure 3). There are three major levels of risk in the implementation process. These levels also have three adjacent levels. Each level is the degree to which one chooses to invest in the humanware's strategies and implementation plan (Table 2). Let's explore what they are:

Conservative. Selecting strategies in the implementation plan that focuses on slow change. The targeted audience is gradually trained on the objectives and assessed bi-yearly. The training plan's benchmarks take *slow constant* steps toward achieving the goals.

Moderate. Selecting strategies in the implementation plan that focus reasonably on change. The targeted audience is reasonably trained on the objectives and assessed quarterly. The training plan's benchmarks take *intermediate pungent* steps toward achieving the goals.

| RISK | CHANGE | TRAINING STRATEGY | BENCHMARK IMPLEMENTATION | ASSESSMENT |
|-------------------------|--------------------|-----------------------|--------------------------|------------|
| Conservative | Slow | Gradual | Slow-Constant | Bi-Yearly |
| Conservative-Moderate | Slow-Gradual | Gradual-Rational | Constant Sound | Quarterly |
| Conservative-Aggressive | Gradual-Direct | Gradual-Assertive | Constant Direct | Quarterly |
| Moderate | Reasonable | Reasonable | Immediate Pungent | Quarterly |
| Moderate-Aggressive | Moderate-Immediate | Aggressive-Reasonable | Immediate Dynamic | Ongoing |
| Aggressive | Assertive | Vigorous | Direct Dynamic | Ongoing |

Table 2. Risk levels and ramifications

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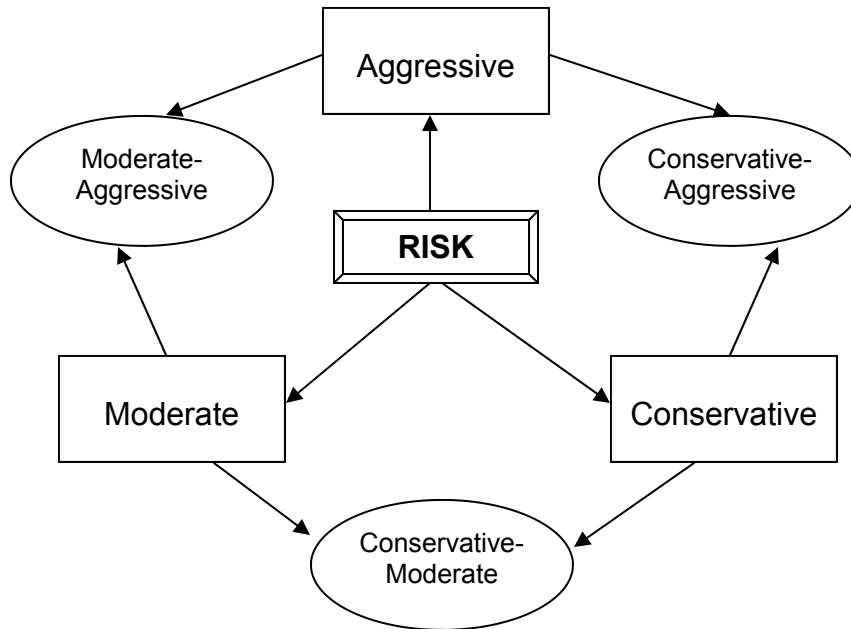


Figure 3. Relationship of risks to strategies.

Aggressive. Selecting strategies in the implementation plan that focus assertively on change. The targeted audience is vigorously trained on the objectives and assessed continually. The training plan's benchmarks take *direct dynamic* steps toward achieving the goals.

Conservative-Moderate. Selecting strategies in the implementation plan that focus on slow-gradual change. The target audience is gradually yet rationally trained on the objectives and assessed quarterly. The training plan's benchmarks take *constant sound* steps toward achieving the goals.

Conservative-Aggressive. Selecting strategies in the implementation plan that focus on gradual-direct change. The target audience is gradually yet assertively trained on the objectives and assessed quarterly. The training plan's benchmarks take *constant direct* steps toward achieving the goals.

Moderate-Aggressive. Selecting strategies in the implementation plan that focus on moderate-immediate change. The target audience is aggressively yet reasonably trained on the objectives and assessed in an ongoing fashion. The training plan's benchmarks take *immediate dynamic* steps toward achieving the goals.

Example Scenario: *The Instructional Technology Department of Winter Park Public Schools identified a need to change the current e-mail system and software applica-*

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tion for all employees. The goal was to train all central office personnel, administrators, and teachers throughout the district on how to use Microsoft Outlook and the web Exchange program for electronic communication. The timeline to move all the users over into the new system was nine months. All employees had to be trained on how to access their electronic mail. The risk for this plan was aggressive because all users existing e-mail program was removed right away and the training happened for the work location the day after the removal of the program. The training package was thoroughly organized with consistent content standards and three levels of trainings for the users. The training strategy also involved each school and department so that they could identify the best delivery of training time. The training was direct yet user friendly so the learners could immediately understand how to start their new e-mail, and the trainers assessed every training session to see how improvements could be made for the next school as well as follow-up sessions with previous schools and departments.

4) Select a contribution method

This step describes the process that tackles the funding for the implementation plan. The cost of investing in humanware is invaluable and the investment pays off in the long run with use of hardware, software, and student learning. By the time planners reach this step, the objectives, time span, and risk level have been established. It is time to outline the monetary expense of the implementation plan. The expense can come in the form of funding sources from corporate or private grants, state or federal funds, and line-item budgets. If the plan has an essential need, there are opportunities for the plan to be funded. When proposing an innovative or pioneering staff development plan aligned with quantifiable goals to improve student achievement, one is looking at areas that can receive grants through a myriad of federal, state, corporate, and non-profit entities.

In the financial world, investments are made using one of two contributing methods: *lump sum or monthly contribution*. Let's examine these two methods with regard to humanware.

Lump sum contribution usually comes in the form of educational grants such as federal or state funds. It can also come in the form of corporate grants. A lump sum contribution is used for spending on staff development programs that have comprehensive goals, objectives, and strategies. These programs are embedded with assessment tools and strategic methods that give benchmarks for the spending efforts. These plans must delineate how all children will benefit and improve their achievement through detailed staff development training components. The plans that utilize the lump sum contribution send thorough reports back to federal, state or corporate entities to explain how the funds were implemented.

Monthly contribution usually comes in the form of line-item budgets for continuous training. These funds are always budgeted for a school or department to implement staff development plans. The goals and objectives are defined at the beginning of a fiscal or academic school year. The objectives are usually

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target a performance need according to the data from the previous year. The funding is short term with only moderate or aggressive risks. Monthly contribution can come in the form of grants (corporate, private, federal, and state) to assist with short-term goals and risks. The plans that utilize the monthly contribution option maintain spreadsheets to document the spending of the plan.

Example Scenario: The Richard Denver and Shirley Phoenix Middle Schools were selected to participate in a special technology camp focused on project-based learning. These two schools represent two opposite spectrums of geographical location in the district and of the socioeconomic status of students attending the schools. A formal and extensive proposal was submitted to the state department under NCLB Title IID Funds outlining a hypothesis that children from all socioeconomic backgrounds can produce higher-order thinking and collaborative projects with the same level of achievement in their documented projects. The lump sum amount was used for procurement of contracted staff development, new hardware tools, and teacher stipends.

5) Provide high-quality training

With the first four steps in place, let's critically look at who is providing the training and technology staff development. A good plan can negate itself if the staff development training on the designed topics is not delivered well or in a timely manner. Selecting who will be doing the training falls under two categories: *contractual bond* or *non-contractual bond* or a combination of both.

Contractual Bond. Refers to obtaining an outside company or consultant to deliver a specific designed training plan. The bond is fixed directly to achieving a settled agreement of skills and the agenda is predefined. A contractual bond does not have the ability to do continuous follow up. The contractual bond is usually set for short-term. The personnel should have experience in instructional technology training objectives and skill sets. Referrals from former clients are highly suggested.

Non-contractual Bond. Refers to using established staff development trainers or instructional technologists to deliver a specific designed training plan. The bond is preset directly to defined objectives with flexibility for adjustments. A non-contractual bond does have the ability to do continuous follow up. The non-contractual bond is perfect for medium and long-term spans. The personnel should be internally qualified staff and noteworthy in technology integration training. A sound record of successful trainings should be available as a portfolio or résumé of success.

To provide high-quality training to invest in humanware, trainers share characteristics such as excellent interpersonal skills, creativity, and experience (Figure 4). They

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should be knowledgeable and have the skills set and expertise. Being able to effectively communicate in an oral and written manner as well as connecting with adults is important to have these interpersonal skills. Flexible to adapt to various environments and teaching strategies is paramount. Trainers should be creative in presenting the information in an original way and have a sense of humor. Offering a positive outlook

on learning and being optimistic shows a great attitude that a trainer should possess. He or she should be experienced in the training topics. If a trainer is a continuous learner of ideas, then this person is reinventing strategies for delivery of content. If the person is a trainer, this means being a change agent. He or she should be someone who inspires other people to “think out of the box” and promotes how to deliver innovative strategies.

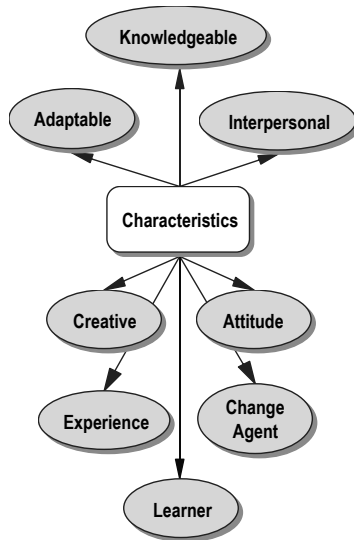


Figure 4. Instructional technologist characteristics.

Example Scenario: *The Hockenburg School District Technology Department has developed a specialized two-year training plan for their technology resource teachers to support the district needs. The focus of the training plan was:*

- Continuing training on the software applications,
- Learning strategies on teaching adults,
- Understanding how to be adaptable in training environments,
- Promoting Marazano’s strategies with technology integration, and
- Creating innovative ways to deliver training,

The department requires the personnel to be highly skilled, experienced, and adaptable to support the schools. The technology teachers are evaluated according to the domains and held accountable for documenting the activities and its outcomes. At the end of the two-year plan, the district will add more personnel to support the schools and educators will be selected by these characteristics: skills set, interpersonal skills, creative ability, teaching & training experience, leadership, professional growth, and personality. These employee benchmarks are also the standard the district’s technology department looks for in selecting outside professional development personnel.

6) Choose the right method

Now you have to decide what path will work to make your investment a success. The previous five steps have been outlined with various conduits for a decision maker or team to execute planning for the humanware professional development plan. It was asked at the beginning, “How could we make a difference with student achievement and learning using technology?” We must focus on the people who will be working directly with the students. Change does not occur just by giving access, availability,

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the latest gadgets, or software programs. All too often educators are looking for quick fix solutions in tangible goods. The intangible goods (all educators) will always be in place as technology changes. It is necessary that the humanware must be invested wisely for systemic change in student achievement and the integration of technology. None of the efforts with procuring hardware or software will make an impact on instruction or practices if people are not invested in a comprehensive manner.

The steps for investing in humanware allow for scaffolding through the strategies and planning to ensure success of humanware and technology integration. Sanborn (2003) states that technology cannot be successful unless we recognize that people who use technology are fallible. Remember, our children will be the humanware carrying the academic torch for future generations. We must provide them with the best possible learning environments to foster critical thinking, innovations, and problem solving to better our society. To get results with technology integration, our greatest asset (humanware) must be nurtured, cultivated, and continuously developed to ensure that the invested technology tools placed in schools make a difference in learning.

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About the Author

Fred Scott is the Instructional Technology Integration Manager at Chesterfield County Public Schools. He may be reached at fred_scott@ccpsnet.net.

