



**Family Center on
Technology
and Disability**

FCTD Conference Series: What Does the Research Say?

February 1 – March 1, 2005

What Does the Research Say?

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EXPERT'S CORNER

Introduction

Questions about the research-base for special education technology practices are increasingly asked at the local, state, and federal level.

Participants in this online discussion will learn how to access the latest research on special education technology and how research can be used to answer important questions about the use and value of assistive and instructional technology for students with disabilities.

Expert's Perspective

What Does the Research Say?

Locating and Interpreting Special Education Technology Research

Dave L. Edyburn, Ph.D.
University of Wisconsin-Milwaukee

Questions about the research-base for special education technology practices are increasingly asked at the local, state, and federal level. The purpose of this online discussion is to provide a forum on how to access the latest research on special education technology and how research can be used to answer important questions about the use and value of assistive and instructional technology.

1. Consumer or Producer of Research?

In a seminal article on the development of special education research competencies, Lewis and Blackhurst (1983) outline a continuum associated with the preparation of leadership personnel. They argue it is important to clarify the purpose of training special education leaders about research. Many practitioners desire to use research to improve professional practice but will not be actively involved in conducting research studies. They refer to this skill set as relevant for

consumers of research. Conversely, some professionals will be actively engaged in research and therefore need a skill set relevant for producers of research.

Periodically the assumptions underlying the research-to-practice paradigm are challenged (Burkhardt, & Schoenfeld, 2003; Malouf & Schiller, 1995). However, the chasm between practitioners and researchers remains deep. Practitioners seek answers to questions about what works for a specific student in a given locale. On the other hand, researchers seek to learn what works across settings. Researchers seek strict methodological compliance in order to control variables so they can understand the impact of an intervention. Practitioners know, in the real world, it is nearly impossible to control all the variables.

As the impact of No Child Left Behind (NCLB) (<http://www.ed.gov/nclb/>) is felt at all levels of education, the demand for research-based evidence about the effectiveness of specific instructional practices has created renewed interest in educational research (Edyburn, 2004). As a result, one of the primary questions participants in this online discussion should answer is, "Do I see myself as a producer of researcher, a consumer of research, or both?"

2. Locating Research

Producers and consumers of research frequently have a need to discover what is already known about a specific topic. Given the critical importance of searching the literature, six strategies for accessing the research knowledge base will be presented and discussed.

3. Interpreting Research

Locating research is only part of the problem for those seeking to use research to improve educational practice. Another significant task involves reviewing and analyzing research studies to understand their relevance and quality. Many educational practitioners are often challenged by the technical nature of this task. Numerous resources will be shared to facilitate tasks associated with interpreting research.

4. Utilizing Research to Improve Professional Practice

Ultimately, the value of the resources that have been identified in this session need to be applied to the task of answering important questions about the use and value of assistive and instructional technology. Examples of some interesting questions that educational leaders have posed relative to utilizing the research knowledge base:

- Are there differences in assistive technology outcomes between students of different ethnic groups?
- Which is better, product X or product Y?
- Does assistive technology within a classroom setting raise children's success in reading?
- What cognitive skill level is necessary to support voice recognition training?

Participants will be encouraged to share questions that they seek answers from the research base to guide their professional practice.

References

Burkhardt, H., & Schoenfeld, A.H. (2003). Improving educational research: Toward a more useful, more influential, and better-funded enterprise. *Educational Researcher*, 32(9), 3-14.

Edyburn, D.L. (2004). Consumer or producer of assistive technology research: Has NCLB altered your role? *Closing the Gap*, 23(3), 12-13, 24.

Lewis, R.B., & Blackhurst, A.E. (1983). Special education practitioners as consumers and producers of research: A hierarchy of competencies. *Exceptional Education Quarterly*, 4(3), 8-17.

Malouf, D.B., & Schiller, E.P. (1995). Practice and research in special education. *Exceptional Children*, 61(5), 414-424.

Expert's Bio



Dave L. Edyburn, Ph.D.

Dave L. Edyburn, Ph.D., is an Associate Professor in the Department of Exceptional Education at the University of Wisconsin-Milwaukee. He earned his Ph.D. in special education from the University of Illinois, Champaign-Urbana. He has classroom teaching experience in both learning disabilities and behavior disorders at the middle school and secondary levels.

Dr. Edyburn's teaching and research interests focus on the use of technology to enhance teaching, learning, and performance. He has authored over 80 articles and book chapters on assistive and instructional technology. Dr. Edyburn's most recent books include: **What every teacher needs to know about assistive technology** (2003, Allyn & Bacon), and **The Electronic Scholar: Enhancing Research Productivity with Technology** (1999, Merrill/Prentice Hall). Dr. Edyburn is also the editor of two journals: **Remedial and Special Education**, and **Special Education Technology Practice**. He is one of three editors of the forthcoming book, **The Handbook of Special Education Technology Research and Practice** (2005).

In 2003, Dr. Edyburn was elected to the Board of Directors for the International Society for Technology in Education (ISTE). He is a past president of the Special Education Technology Special Interest Group (SETSIG) in the International Society for Technology in Education (ISTE) as well as a past president of the Technology and Media (TAM) Division of the Council for Exceptional Children (CEC).

He is a frequent conference presenter and national workshop leader.

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Transcript: What Does the Research Say?

- **Welcome!** by **Dave Edyburn** on Feb 01, 2005
I look forward to a lively discussion about research on special education technology.
 - **Pressing Issues** by **Phil Parette** on Feb 01, 2005
Dave:
What in your estimation are 3-5 of the most pressing issues currently in the field regarding research in AT?

- **Re:Pressing Issues** by **Dave Edyburn** on Feb 01, 2005

Phil:

Good question. Given the focus of this discussion, I will limit my response to 5 issues relative to research, rather than addressing a broader array of issues (e.g., professional preparation, funding, expectations, etc.).

Here are some initial ideas:

--It is essential that we engage in data collection to answer fundamental questions about how many children and youth use assistive technology and whether or not the IDEA mandate to consider assistive technology is meeting its intended purpose of whether large numbers of students are left unserved or are underserved.

--It is essential that we increase the research capacity of the field to address critical questions of what works, for whom, and under what conditions.

--It is essential that we develop theories, frameworks, and models for understanding the application of assistive and instructional technology relative to consideration, intervention, and outcomes.

--It is essential that we learn how technology enhances educational performance. Given the expectations associated with No Child Left Behind, how should assistive technology, instructional technology, and universal design be utilized to remediate academic deficits or compensate for the impact of a disability?

--Finally, since there are so many more issues that time and space allow, I would like to direct you to an article that I wrote that proposes a modest research agenda (what we need to know): Edyburn, D.L. (2001). Critical issues in special education technology research: What do we know? What do we need to know? In M. Mastropieri, & T. Scruggs, (Eds.), *Advances in Learning and Behavioral Disabilities*, Volume 15, (pp. 95-118). NY: JAI Press.

Hope this helps for now. I'll be interested in your thoughts on this topic!

Dave

- **Re:Pressing Issues** by **Rose N.** on Feb 02, 2005

Hi Dave,

I agree with the items on your list, although they seem somewhat overwhelming given the current state of play in the field. I'm coming from the general edtech world, where there have been quite a few research studies on the effectiveness of one approach or another, and of one type of tech tool or another. Unfortunately, after 15 years of studies, we still don't seem to have much agreement on what works and what doesn't. Technology in the general ed classroom remains peripheral to the curriculum, with its use pretty much dependent on how wealthy the school is and how technophobic the teacher is. Many of the studies that have been done have been widely criticized as too anecdotal or otherwise invalid. I guess my question is, what can the special education/AT field learn from the general edtech world? Given the more limited sample sizes (per Jackie's post) is it likely we'll be more successful than the larger field?

Rose Newberry

- **Re:Pressing Issues** by **Dave Edyburn** on Feb 02, 2005

Rose:

Excellent points!

The issue of the relationship between assistive technology (AT) and instructional technology (IT) is an important dimension of my work. (In addition, I add the philosophy of universal design (UD)). I didn't add this to the top five research issues because I am not sure that the alignment of these three diverse perspectives will result from research. Instead, I believe other factors (i.e., political, financial) will advance an action agenda much sooner than the time it will take to create a research base. Indeed, in the NCLB era, the emphasis on student achievement is beginning to cause some people to say things like, "I don't care what you call it, I want technology that will help low achieving students meet AYP!" (annual yearly progress).

Some resources that may interest you on the points you have raised:

CARET is a special project funded the International Society of Technology in Education (ISTE). The purpose of the project has been to capture and analyze the research literature on the effectiveness of educational technology. Interested readers can access this wealth of information at: <http://caret.iste.org/>. I think this is an accessible archive of what we have learned from the research. However, when drilling down to the individual study level, some concerns may be raised about the extent of the research base for some of the generalizations. Nonetheless, I find that many teachers, administrators, researchers, and administrators like the format of this approach for making research accessible. I think the CARET work has much to inform special education about the research findings of technology in education.

If you are interested in the connections of AT & IT, I would suggest that you consider membership in the Special Education Technology SIG (SETSIG) within the International Society of Technology in Education (ISTE). It's free if you are an ISTE member. Learn more by visiting: <http://www.iste.org/setsig/>. This organization is particularly interested in the relationship of AT & IT and the use of AT in the general education classroom. They have a number of online benefits of membership and meet annually at the National Educational Computing Conference (NECC) [this year in Philadelphia at the end of June].

I think your comments are right on target--especially as they relate to students with mild disabilities. I perceive an urgent need for leadership in capturing the potential of technology in ways that enhance academic performance. Indeed, there is a research agenda here.

Thanks for sharing your thoughts on this important topic.

Dave

- **Re:Welcome!** by **Angela** on Feb 01, 2005
Your discussion topic is very timely for me. Last night I started my first class, working towards a Learning Behavior Specialist II for Assistive Tech in Illinois. I have to write a position paper and I am hoping to do something related to technology and its benefits in Special education. The paper will require a lot of research so I hope this will be helpful. I am looking forward to logging on.

Angela

- **Re:Welcome!** by **Dave Edyburn** on Feb 01, 2005
Angela:

Welcome.

A good place to start might be to access two electronic journals:

Assistive Technology Outcomes and Benefits

<http://www.atia.org/atob/ATOBV1N1/>

Journal of Special Education Technology

<http://jset.unlv.edu>

I look forward to seeing your future posts. Best wishes on your project.

Dave

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- **Sample size** by **Jackie** on Feb 01, 2005
At the recent ATIA conference, the perennial issue of sample size came up. In one particular presentation, audience members were tantalized by the presenter's research results, until he mentioned that the sample size was under 20. Given the problem in the disabilities field of trying to identify a large group of kids with similar functional abilities (in geographically proximate locations), what standards should the field be held to?
Thanks,
Jackie

- **Re:Sample size** by **Dave Edyburn** on Feb 01, 2005
Jackie:

This is a very interesting and important question.

As you noted, obtaining an adequate sample can be difficult for many reasons: cost, geography, low incidence disabilities, etc.

Determining the appropriate size for a sample is dependent on many factors so it is difficult to provide a simple answer. Researchers interested in exploring this question might find the following web site useful:

Sample Size Calculator

<http://www.surveysystem.com/sscalc.htm>

Personally, I would recommend consulting a statistician to review the research design and sampling plan to obtain formative feedback in the development of the research proposal.

While we often think that more is better when it comes to sample size, even studies with a small sample can be informative; depending on the quality of the research and the decisions that are to be made. For example, a well-designed case study can be very appropriate for informing decisions concerning an individual or small group of students. However, such research evidence is not likely to be adequate for informing district-wide decision making. The critical issue for researchers and practitioners is generalizing from the sample to the population.

New developments in the area of large-scale databases may help us in the future address issues associated with measuring the outcomes of assistive technology when used by individuals with low incidence disabilities. My colleagues at the ATOMS Project have considered this issue in the development of future assistive technology outcome measurement systems. We refer to the concept as "dynamic norming." You can read more at Edyburn, D.L., & Smith, R.O. (2004). Creating an assistive technology outcome measurement system: Validating the components. *Assistive Technology Outcomes and Benefits*, 1(1). *Electronic Journal*. Available online at: <http://www.atia.org/atob/ATOBV1N1/>.

Hope this helps. Again, great question!

Dave

- **Re:Sample size by Guest** on Feb 09, 2005
When you speak of "new developments in large-scale databases" are you thinking of using technology to gather data from disparate parts of the country? In the February issue of "Innovate" Bruce Ingraham argues that communications technology can be used by the academic community to create, disseminate, and evaluate research. This would seem to be a way to create larger sample sizes, particularly for research involving low-incidence disabilities.
- **Re:Sample size by Dave Edyburn** on Feb 14, 2005
Yes, data collection is one aspect of this conversation. However, I tend to think about the larger research enterprise.

An interesting and inspiring vision about the relationship between technology and educational research can be found in:

Willinsky, J. (1999). *Technologies of knowing*. Boston: Beacon Press.

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- **Producer vs. Consumer, Two Roles?** by **Dave Edyburn** on Feb 02, 2005
Lewis and Blackhurst (1983) suggested that special education leadership training needed to consider the different roles of leaders: some will be producers of research, some will be consumers of research.

Do you think this dichotomy is a valid distinction?

Should everyone be trained in both aspects or should specific competencies be developed for each role?

Does No Child Left Behind (NCLB) reinforce this distinction or require that everyone have advanced levels of research training in order to collect research-based evidence as part of their daily practice?

Dave

- **Re:Producer vs. Consumer, Two Roles?** by **Cynthia** on Feb 04, 2005
I've been thinking about this question since I read it yesterday. On one hand, I think there shouldn't be a distinction, in that, you're a far better producer of just about anything, including research, if you've been on the consuming end. Likewise an experienced consumer makes a better producer. So I certainly think that if you're being trained to produce research, you should have a lot of experience consuming it (and I think that in fact happens). There probably needs to be better training of educators in how to be thoughtful consumers of research, because I think that pre-service training (and university training across the board) is weak in that regard.

One of the biggest differences I think is in the vocabulary used by each group. As with every field, researchers have an exclusive jargon that defines some people in their group and others out. (I'm definitely an "out.") I'd like to see research packaged in a way that the average special educator could get through it with a standard Webster's. I can't tell you how many research articles looked interesting to me until I started to read them. There's so much jargon and math that you can't figure out what the researchers' conclusions were. I find there's a gap between the articles that have been so dumbed down that there's "no there there" and those like the ones I just described. Personally I'd like to see something in the middle.

- **Re:Producer vs. Consumer, Two Roles?** by **Dave Edyburn** on Feb 04, 2005
Cynthia:

Thanks for the thoughtful response!

While the distinction between producers and consumers may make sense in the context of professional preparation (so that graduates leave with in-depth knowledge in one area), I have been wondering if the post-NCLB era requires us to rethink the essential skills needed by all.

In my role as a journal editor, I try to ensure that authors devote as much attention to the implication of the research as they do to explaining their methodology. In my role as a teacher educator, students commonly tell me they read the introduction and then jump to the discussion because they can't make sense of the information in the middle.

Here's are some resources that I have found useful to share with teachers, administrators, and policy makers looking for a primer to help them navigate some of the nuances of a research report:

How to read a paper: Assessing the methodology
<http://bmj.bmjournals.com/cgi/content/full/315/7103/305>

A Policymaker's Primer on Education Research: How to understand, evaluate

and use it

<http://www.ecs.org/html/educationIssues/Research/primer/index.asp>

Perhaps they will be of some help to you. Thanks for writing!

Dave

- **controlling variables** by **Liz** on Feb 04, 2005

I'm glad to have this chance to ask a really basic (maybe dumb) question that's been on my mind for years. How can outcomes data be truly valid when we can't control so many of the factors involved in a child's learning? The whole idea that we can test what's in a child's mind in the same way that we can test what's in his blood (the medical model, in other words) has never made sense to me. As a teacher, I see the huge difference made by parents who work with their children at home versus those that don't. I see how differently students perform on days when it's raining and they haven't been able to have outdoor recess, when they haven't eaten their lunch, when they've had a fight with a peer that morning, etc., etc.

How can a researcher base a conclusion on a single post-intervention measurement (particularly if there's a small sample) when you can't control all the other variables in play that day?

Thanks for the answer.

- **Re:controlling variables** by **Dave Edyburn** on Feb 04, 2005

Liz:

You have identified a key question!

Some background: most of the educational research that is conducted and published is considered quasi-experimental. That is because, it is extremely difficult to implement true experimental designs. Without the ability to randomly select participants from the population and randomly assign to treatments, the ability to generalize beyond the sample is called into question.

Conducting research in the real-world is much more challenging than research conducted in labs where everything can be controlled. At best, educational research, conducted with large representative samples, using random selection and random assignment can control for many factors. However, there is not much discussion of the financial investment required to produce this level of scientific research base in education.

Your question also raises a deeper issue of whether education is an art or a science. I think it is safe to say: the current educational environment is focused on education as a science. (Some interesting reading: How people learn, <http://www.nap.edu/html/howpeople1/>). Hence the emphasis on evidence of effective interventions.

Your question is extremely relevant to the research my colleagues and I are engaged in concerning the measurement of assistive technology outcomes (for more info on the ATOMS Project, visit: <http://www.atoms.uwm.edu>). In technical terms, the difficulty in isolating concurrent interventions, is a confounding factor in assistive

technology outcomes research. That is, how can we attribute enhanced performance to assistive technology when the child was going to class everyday (learning!) and receiving occupational therapy, etc.?

I hope your question stimulates more discussion within the electronic community.

Dave

- **Re:controlling variables** by **Jean** on Feb 07, 2005
I just wanted to say thanks, Dr. Edyburn, for the reference to "How People Learn." I read it over the weekend and found it VERY interesting. The authors, however, were focused entirely on the learning experiences of typical children. That's understandable, but it makes the resource of somewhat limited use to those of us who deal with children whose neurological conditions cause them to learn (or not) in perhaps different ways, and certainly at a different pace, than that of the typical child. It seems simplistic to say that a disabled child's learning pattern is greatly influenced by the nature and age of onset of his or her disability. But I'm wondering if there's any research out there that attempts to describe learning patterns associated with different disabilities and different ages of onset. Is this even a meaningful framework? (I'm thinking of Dr. Koppenhaver's comments, during one of these discussions on emerging literacy. He talked about focusing on a learning continuum apart from age and disability.) Hope this makes sense. Thanks for your answer.
J. Keller

- **Re:controlling variables** by **Dave Edyburn** on Feb 14, 2005
Jean:

Thanks for this note! Sorry to give you such a long reading assignment over the weekend!

I concur with your observation about the focus within the How People Learn. I believe it is important to understand how some works are influencing national policy. And in our case, the learning patterns and special needs of persons with disabilities are not being addressed in the current conversations about schooling and the learning sciences. While there are many situations in which learning processes may be the same for all people, the cumulative impact of a disability that impacts learning illustrates the critical need to develop additional interventions that foster learning. A question I have been asking workshop participants with increasing frequency: How much failure data do you need before you know I can't do a task? (And, what are you going to do about it?).

The question you have asked is an important one (research on different learning patterns associated with specific disabilities and age of onset). However, this is not an area within my expertise. Does anyone have any advice to share about how to access what is known about disabilities and learning patterns?

Dave

- **AT for low vision** by **Greenfield** on Feb 06, 2005
I am interested in learning more about assistive technology that can improve the communication of individuals with low vision (resulting from cataracts). I have some knowledge of software that can be helpful (eg. Wynn, Dragon Naturally Speaking), however I would like to know if there are other software programs or AT that has been beneficial to this specific need.

- **Re:AT for low vision** by **guest** on Feb 23, 2005
Depending on your client's limited use of vision. Software programs like Zoom Text, Big Shot tend to help. Also, the use of Closed Circuit Television (CCTV) both stand alone and portable help as well. Software for the blind that uses a speech synthesis for hearing what is being viewed on the screen. Such programs are JAWS and Window Eyes are beneficial. The idea is to conserve the energy being expended through limited vision and maximizing other avenues that decreases that energy expenditure. Links to look at www.aisquared.com and www.freedomscientific.com
Hope this helps

Andre Ryssemus

- **Re:AT for low vision** by **Katrina Weibel** on Feb 24, 2005
IBM Web Adaptation Technology can be helpful to individuals with low vision in accessing the internet. The software features include reading selected text to the user, enlarging text and images, changing text color, removing backgrounds, and removing distracting animations. The software is being piloted by PACER Center and is free to anyone who is interested. Contact PACER's Simon Technology Center at 952-838-9000 or by email at stc@pacer.org to request a copy. I hope this is helpful.
Katrina Weibel

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- **Encouraging use of AAC devices** by **Andrea Nance** on Feb 07, 2005
What are some techniques to encourage the use of an AAC device in which the user chose? I have a 54 year old African American female with Broca's aphasia. She has the CHAT PC handheld AAC device. After subsequent visits following an AAC assessment, it is obvious she does not use it as her primary means of communication. Are there any techniques that would encourage her use of this device? What are your recommendations? Any info. would be helpful.

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- **Locating historical research** by **Dave Edyburn** on Feb 08, 2005
Sometimes we need to locate historical research to understand the context of current research and practice.

Two sources for archived bibliographies are listed below.

1. NCITE Research Synthesis
<http://idea.uoregon.edu/~ncite/documents/techrep/other.html>

Look for the fourth bullet (Quality and availability of assistive technology devices) and click on the following two links:

Research synthesis, Tech. Rep. No. 7 (1994) (PDF Format)

Executive summary, Tech. Rep. No. 8 (1994)

2. The SERC Library: Bibliographies

<http://www.ctserc.org/library/Articles/Bibliographies.shtml>

A gold mine of special education bibliographies. In particular, look for

Assistive Technology bibliography

<http://www.ctserc.org/library/bibfiles/at.pdf>

Alternative and Augmentative Communication bibliography

<http://www.ctserc.org/library/bibfiles/aac.pdf>

Computers and Special Education bibliography

<http://www.ctserc.org/library/bibfiles/comp-sped-95-01.pdf>

Hope this helps those interested in finding historical special education technology research.

Dave

- o **Re:Locating historical research** by **Nat** on Feb 16, 2005
Excellent resources. Thanks!

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- **training for assistive technology** by **heather** on Feb 08, 2005
I am in a graduate level class dealing with assistive technology. Between the time that I take this class and the time that I graduate, some years will pass, and the technology will change. What are some ways that I can stay abreast of the changes that happen in assistive technology? Are there some training courses that other professionals take part in to help them stay current?

- o **Re:training for assistive technology** by **Dave Edyburn** on Feb 09, 2005
Heather:

Good question! Staying up-to-date is an important challenge for any professional.

Some ideas on how you might continue your professional development include:

--Subscribe to a professional journal and read each new issue when it arrives. Some good ones to consider include: Journal of Special Education Technology (<http://jset.unlv.edu>), Closing the Gap, (<http://www.closingthegap.com/>) and Special Education Technology Practice (<http://www.setp.net>).

--Attend a professional conference. Some national conferences to consider: Closing the Gap (Minneapolis, Oct each year), Assistive Technology Industry Association (Orlando, Jan each year), Technology, Learning and Reading Disabilities (San Francisco, Jan each year) and CSUN Technology and Person with Disabilities Conference (Los Angeles, March each year). Of course, many states have a state AT conference or an AT strand within the state educational technology conference.

--Participate in online events, distance education courses or electronic communities. Some useful resources include: Assistive Technology Training Online,

<http://atto.buffalo.edu>), Special Needs Opportunities Window (<http://snow.utoronto.ca>), Virtual Assistive Technology University (<http://www.alltech-tsi.org/initiatives/vatu/>) and the QIAT Listserv (<http://www.qiat.org>).

--Join a professional organization devoted to special education technology. Two that I would recommend are: Technology and Media (TAM) Division of the Council for Exceptional Children (CEC) (<http://www.tamcec.org>) and Special Education Technology Special Interest Group (SETSIG) of the International Society of Technology in Education (ISTE) (<http://www.iste.org/setsig/>).

Does anyone else have ideas and resources to add that are useful for keeping professionals current about technology in special education?

Dave

- **Re:training for assistive technology by Nat** on Feb 16, 2005
These are good suggestions, and I personally use many of them. Check out what your state tech act program has in place. In our state (MN) the state department of ed has a list serve that provides lots of help, as well as a state conference, and a summer institute. There are also regional networks that meet regularly to talk about local issues. Particularly when you work in a field as diverse as AT, it helps to have local and statewide resources. The mentoring that happens through list serve groups (QIAT) and our state list serve have been valuable.

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- **Top research on AT in spec ed.** by **AC** on Feb 09, 2005
I am an assistive technology specialist very interested in research results on AT efficacy. When I have time, I will take a look at the many AT research resources you have provided, however, I wonder if you would be willing to highlight in this discussion maybe one or two research projects or studies that have yielded important findings in terms of AT efficacy? I know this is about as broad as you can get, but if something comes to mind that you feel like sharing, I'd be interested!

THanks,
Annette Cerreta

- **Re:Top research on AT in spec ed.** by **Dave Edyburn** on Feb 09, 2005
Annette:

What a great, really hard, question!

First, let me offer a brief commercial for a new book that will be available in March: Handbook of Special Education Technology Research and Practice edited by Dave Edyburn, Kyle Higgins, and Randall Boone. (A copy of the Table of Contents and Order Form is available at <http://www.knowledge-by-design.com>). As one of the editors, I have been privileged to read the entire 900 pages (several times!). This book marks the first time our research literature has been gathered into one place. As you will notice when reading or browsing the book, we know far more about some aspects of special education technology (e.g., writing) than about others (e.g., use of technology by students with autism). In short, this resource will allow you to examine specific questions of AT efficacy (AAC, universal design, reading, web accessibility, etc.) in more detail than I could go into here with your general question.

Indeed, the process of inviting authors and preparing manuscripts for publication has also taught us that there is more we don't know (e.g., how many students use AT?) than things we do know.

I believe our field suffers from an historical limitation: until recently, we never really attended to issues of measuring the outcomes of assistive and instructional technology. One reason is that the outcomes were quite clear: an individual with a disability could not perform a task, an AT team provided "good stuff," and then there was obvious improvement because the person could perform the task with greater independence, satisfaction, in less time, etc. The standard for outcome was between the individual and the AT specialist. We never relied on standardized measures of outcome. Obviously, in the current era of accountability, looking back, we seem so foolish to think this standard could be adequate for decision-making. I believe this observation partially explains why our research base appears so limited.

So, what do we know? I think we know that technology enhances performance of individuals with disabilities in critical life function areas: mobility, communication, and learning. We know that sometimes technology allows a person to complete a task that otherwise they would never be able to complete. We know that not everyone who could benefit from assistive technology has access to appropriate devices and services.

Do we know if product X is better than product Y? Usually not.

Can we predict who will benefit from a specific AT device? No.

Does the appropriate AT allow a person with a disability to perform at a level that is indistinguishable from their nonhandicapped peers? Seldom.

Three research centers are currently conducting research on the critical issues associated with the efficacy of assistive technology. They are excellent resources for emerging research findings:

National Assistive Technology Research Institute (NATROi)
<http://natri.uky.edu>

The Assistive Technology Outcomes Measurement System (ATOMS) Project
<http://www.atoms.uwm.edu>

The Consortium for Assistive Technology Outcomes Research (CATOR)
<http://www.atoutcomes.org>

In closing, I will continue to add resources that point readers to specific resources on special education technology research. In addition, I will review some specific studies and highlight what I feel are some significant findings. In the meantime, I look forward to continuing the dialogue on this important topic.

Dave

- **Re:Top research on AT in spec ed.** by **Richard** on Feb 14, 2005
With no disrespect intended, I guess I have mixed feelings about spending a great deal of money to document the obvious. What I'm including in "the obvious" is the following:

- Giving a motorized wheelchair to a child will greatly increase that child's sense of freedom, control, and all the things that go with that - greater self-esteem, easier access to educational materials, etc.
- Allowing a child who can't properly write with a pencil to use a keyboard will result in the child writing a great deal more, in a shorter period of time.
- Training a teacher in how to support a child's AT will result in far greater success than not training him or her.

I have to wonder why the Dept. of Education, at both the federal and state levels, are demanding expensive studies to document things at that level of generality. Clearly we can't have large sample studies that pinpoint the best AT for a given child. (And it's not like we didn't consider whether a device or a service was working in the "old days.")

Is their real goal to justify not spending AT dollars, as in "if you can't prove it has a specific, and positive, educational outcome, then we're off the hook for funding it"?

The world of education just isn't a hard science. Trying to pretend that it is and that research techniques drawn from the hard science world are appropriate seems like a vanity to me. And one we can ill afford. I'm not a conspiracy theorist generally, but I wonder if this emphasis on outcomes research being tied to a slashed education budget is really just coincidence.
RC

- **Re:Top research on AT in spec ed.** by **Dave Edyburn** on Feb 14, 2005

Richard:

Wow!

I was in a series of meetings today and some people were connecting the dots: some people argue the AT community has failed to demonstrate the outcomes of assistive technology; the current budget proposal has zeroed out federal funding for assistive technology; is there a relationship?

Many observers have commented that good research tends to confirm the obvious (e.g., students tend to learn to read by spending more time engaged in reading...).

While I believe there are a number of things we can learn through research, personally I wonder about the need to "prove" the outcome of assistive technology in the context of mobility, communication, and independence. When we are talking about essential life functions that are impaired as a result of a disability, shouldn't there be a birth through death system of identifying, providing, maintaining, and replacing assistive technology? (Some recent estimates I've seen indicate only about 2-3% of school-aged children with disabilities use assistive technology.) Perhaps we need to engage in some accounting of the costs associated with unrealized human potential, or the cost of failing to act.

Thank you for sharing this provocative perspective. I hope your comments spark a lively discussion.

Dave

- **Re:Top research on AT in spec ed.** by **guest** on Feb 15, 2005

I'm with Richard, and appalled by the budget of the supposed education president. Among the other "obvious" things that should happen but don't, in this society in which we'll mis-spend billions for war but spend pennies for peace:

(1) Families leaving the hospital with a baby with disabilities should receive AT training before they leave.

(2) Families dealing with ChildFind services should receive AT training at the ChildFind facilities.

(3) Every pre-service teacher education program should include multiple courses in AT, not a 3-hour, one-time lecture (which is what I received).

(4) Schools should be adequately funded, so that it's not a constant war between gen.ed. and spec.ed., between the school and the parents, between music and art, between sports and the library.

Sorry for the rant. I guess I should tie this to research. I suppose you'd have a far greater pool of research subjects if you identified families at the hospital and ChildFind stages, and you'd have more willing teachers (willing to take the time to supply data) if they had the right training and adequate salaries.

Frustrated 5th grade teacher

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- **What Have We Learned Lately?** by **Dave Edyburn** on Feb 17, 2005

Most professionals report inadequate time to stay current with their professional reading. Given the vast number of journals that publish work relevant to special education technology, how does a person find all the articles relevant to his/her interests? And, with increased interest on the research base in our field, how can we find the latest research?

Some participants in this discussion may be aware of some of my work to create an annual review of the literature. I use a new research methodology known as "the comprehensive one-year review." Given the long winters in Wisconsin, I review a large collection of professional journals (n=31), capture all articles relevant to special education technology, and then create an extensive set of indices for accessing the new additions to the knowledge base. Essentially, this annual synthesis provides an answer to the question, "What have we learned lately?" Reviewing this single article each year will provide readers with ready access to new advances in special education technology research and practice. While you may want to read all the articles I identify, the value of the review is to assist you in locating the handful of research and practice articles most relevant for your work.

The reviews are published in print annually and subsequently available online. Here are the citations for the annual reviews completed during the past five years:

Edyburn, D.L. (2004). 2003 in review: A synthesis of the special education technology literature. *Journal of Special Education Technology*, 19(4), 57-80. To be posted online soon

at <http://jset.unlv.edu>.

Edyburn, D.L. (2003). 2002 in review: A synthesis of the special education technology literature. *Journal of Special Education Technology*, 18(3), 5-28.

Also available at: <http://jset.unlv.edu/18.3/edyburn/first.html>

Edyburn, D.L. (2002). 2001 in review: A synthesis of the special education technology literature. *Journal of Special Education Technology*, 17(2), 5-24.

Also available at: <http://jset.unlv.edu/17.2/edyburn/first.html>

Edyburn, D.L. (2001). 2000 in review: A synthesis of the special education technology literature. *Journal of Special Education Technology*, 16(2), 5-25.

Also available at: <http://jset.unlv.edu/16.2/Edyburn/first.html>

Edyburn, D.L. (2000). 1999 in review: A synthesis of the special education technology literature. *Journal of Special Education Technology*, 15(1), 7-18.

Also available at: <http://jset.unlv.edu/15.1/edyburn/first.html>

If you are not familiar with these resources, you may wish to browse the online versions. A series of tables analyze the literature and provide notations to each article found in the appendix. Each review typically captures 190-220 article citations.

I hope you find these annual reviews useful in your work. Time to get back to work on the 2004 review...

Dave

- **Participation in research** by **Susan Ellyn** on Feb 22, 2005

This may be a question without an answer, but I was wondering how a special education teacher who wanted to participate in a research study would go about finding a researcher and a study that was looking for participants. Thanks.

- **Re:Participation in research** by **Dave Edyburn** on Feb 22, 2005

Susan:

This is a good question! It may be hard to answer at a national level but let me give you some ideas:

1. Contact your local university and talk with faculty members in the special education department. Find out what kind of research they are conducting. Often, if you can find a match, this is the best way to engage in research.
2. Follow the work of national research centers and contact the staff to find out how you might partner with them. You might discover a variety of opportunities: collecting data in your classroom, giving feedback on protocols, serving on an advisory board, etc. Three national research projects in assistive technology that you might consider contacting include:

National Assistive Technology Research Institute (NATRI)

<http://natri.uky.edu>

The Assistive Technology Outcomes Measurement Systems (ATOMS) Project

<http://www.atoms.uwm.edu>

The Consortium of Assistive Technology Outcomes Research (CATOR)

<http://www.atoutcomes.org>

Hope this helps. Any other suggestions from our webboard participants?

Dave

- o **Re:Participation in research by KTJ** on Feb 28, 2005

Susan,

Interesting that you should post your question because I am interested in doing some research and am wondering the reverse - how do I find a special ed teacher or school or district willing to participate in the research that I'm proposing.

(I'm an independent Assistive Technology Consultant)

Are you by any chance in Massachusetts?

-
- **Rearward versus forward-looking research by KM** on Feb 22, 2005

I'm concerned that much (most?) of the research being funded in AT focuses on old rather than new and emerging technology. While it makes sense that "best practice" research would, by definition, focus on techniques and technology that have been around awhile, how we will ever move the field ahead if we don't make a research-based case for emerging technologies? With funding drying up, competition for research dollars will be even stiffer and this problem is likely to get worse I'm afraid, not better.

KM

- o **Re:Rearward versus forward-looking research by Dave Edyburn** on Feb 22, 2005

KM:

You have identified an important issue intrinsic to the process of conducting research and disseminating the results. That is, time.

Development of a research proposal takes time. It takes time to review the proposals. More time goes by in the process of making a grant award. Of course, the researcher needs time to conduct the research. More time to analyze the data and write up the results for publication. Then there is the time devoted to peer review of the research manuscript. If things go well, the manuscript is accepted for publication. However, more time goes by as the manuscript works its way through the production and publication process. Finally, the results of the research appears in the journal literature and becomes part of the shared knowledge base.

This issue is particularly challenging to the technology community. The example described above could stretch over 3-5 years. We know that technology products have a different life cycle. As a result, some question the value of a well-designed research study that utilizes a product that is no longer available in the marketplace.

As I think about these issues I wonder about "evidence" and "proof." That is, how

much evidence is enough proof to inform a decision that something works. Personally, I think we need to recognize different standards of proof when making decisions. Evidence that may be convincing for decisions involving a single student are not likely to be convincing for decisions involving hundreds of students. Therefore we might want to think about ways to use research to accumulate evidence that increases the confidence we have in our decisions.

Demonstrating that a new/emerging technology is effective often involves research that makes comparisons with traditional methods. Increasingly, many researchers and practioners are asking if this is an appropriate comparison (think about incremental change vs fundamental change). However, even if we can get past these issues, we are still subject to the time constraints noted above for grant writing, research, and publication.

In short, I hope your comments stimulate more conversation about the role of research in the context of technology innovation and the dissemination of research-based best practices. Clearly, the traditional research paradigm will now allow us to move fast enough to capture the potential of existing technologies with our current students. I look forward to more conversation on this important topic.

Dave

- **Re:Rearward versus forward-looking research** by **Marge** on Feb 23, 2005

What a great, articulate explanation of a problem we all face! Thanks, Dave (and for the other resources you've supplied).

I hate to weigh in with a negative comment, but I have to say that I've been surprised, as a grant reviewer, at the lack of expertise about emerging, and even established technologies, on the part of grant reviewers with whom I've served. I understand that the peer review system isn't perfect, but I've often wondered how professionals can fairly review a proposal based on a particular technology, when they aren't familiar with the technology's strengths, weaknesses, historical performance, etc. As a "researcher's researcher" have you ever found this to be a problem? Maybe it's not as pervasive as I fear, or at least doesn't have that much of an impact on the field.

- **Re:Rearward versus forward-looking research** by **Dave Edyburn** on Feb 25, 2005

Marge:

Thanks for the feedback.

I have not experienced the situation you have described in the context of grant proposal reviews. However, I frequently see a gulf between the knowledge and skills of my colleagues in public schools and teacher educators. Front line leaders are using the latest technology and have a great technical understanding of products. In contrast, teacher educators and researchers are sometimes trailing in their knowledge of emerging technologies.

In my experience, this gulf makes it essential that we establish partnerships to ensure that our teams are as strong as possible.

What do you think?

Dave

- **Communication for a client with ALS** by **Emily Bryan** on Feb 23, 2005

I have a client with ALS that is currently using a Cooper-Ran to communicate. He is looking for a more effective device because his condition is getting worst and he tends to fatigue easily when using it. He is interested in an Aug. Comm. device to help him communicate more effectively. He also needs a device that includes environmental controls. Would you have any suggestions on what device I may look into.

- **Re:Communication for a client with ALS** by **Dave Edyburn** on Feb 26, 2005
Emily:

Wish I could help, but this question is beyond my area of expertise. Any suggestions from other participants?

Dave

- **Re:Communication for a client with ALS** by **KTJ** on Feb 28, 2005
Post this question on the QIAT listserve and you will obtain many thoughtful responses from leaders in the field of Assistive Technology. www.qiat.org and go to listserve. Check out the archives first as this question was recently asked and of course it does depend upon the skills that your client still has in place.
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- **Assistive Technology Training in Early Childhood** by **Phyllis** on Feb 23, 2005

I am currently working on my thesis regarding some of the barriers that families and staff encounter when trying to navigate the AT maze. One is the lack of training and support. Many of the staff at my site, as well as many others have little background or training in AT. Although we have the CSUN Tech Conference in L.A., this is just about all we have been able to find in terms of staying current with new products/ devices, etc. However, there seems to be a lack of training for parents, professionals, and paraprofessionals for AT in early childhood (birth to 5 years). Why is this and are you aware of any such training in the L.A. area (we are in Northridge, CA). All the trainings we have come across are for school-age children, secondary education, vocational, etc. Our children with or without special needs wouldn't be using word processing programs, etc. That seems to be the focus of many of the trainings.

- **Re:Assistive Technology Training in Early Childhood** by **Dave Edyburn** on Feb 26, 2005
Phyllis:

I hope many other participants in this webboard will post their suggestions for you.

I think everyone will agree that not enough is being done to facilitate parent/family development and the use of technology in the home. Indeed, we know a great deal about the value of early intervention that seems like it would extend to the concept

of assistive technology. As a result, it seems like there is plenty we could be doing.

I am not able to speak directly to training resources in the Los Angeles area. I can share a few national resources that may assist you in making some great contacts.

Family Center on Technology and Disability

<http://www.fctd.info>

Given your involvement in this webboard, I trust you already know about this excellent resource!

The PACER Center

<http://www.pacer.org>

Based in Minneapolis, an acknowledged leader in parent training and assistive technology. Coordinates a network of parent education centers.

The Alliance for Technology Access

<http://www.ataccess.org>

A national network of AT centers designed specifically to assist individuals with disabilities and their families.

Some distance education training options might be relevant:

Assistive Technology Training Online

<http://atto.buffalo.edu>

Special Needs Opportunity Window (SNOW)

<http://snow.utoronto.ca/resources/technology/techadap.html>

Finally, some resources on cultural and linguistic diversity have specifically focused on young children and AT:

CLAS

<http://clas.uiuc.edu/>

Judge, S.L., & Parette, H.P. (1998). Assistive technology for young children with disabilities: A guide to providing family-centered services. Cambridge, MA: Bookline.

Hope this helps for now. Best wishes as you complete your thesis.

Dave

- **Re:Assistive Technology Training in Early Childhood** by **Donna Lehmann** on Feb 28, 2005

Being an AT person who specializes in early childhood I have been wondering why there are not evaluation instruments created with preschoolers in mind. We use the WATI forms but they are slanted towards school age tasks. There may be evaluation tools out there, like the new AT wheel for early childhood, but perhaps we need to add to that? Any ideas are appreciated.

- **Re:Assistive Technology Training in Early Childhood** by **Dave Edyburn** on Mar 01, 2005

Donna:

I agree. In the early 1980s, young children with disabilities were among the first to be recognized as being able to benefit from assistive technology. Some pioneers are still doing some interesting things but I think the focus on AT in early childhood has faded. Perhaps you can help raise the profile.

One resource you may be interested in knowing about involves the current work of Sue Mistrett at the University of Buffalo. With longstanding interest in AT for young children, Sue has focused her attention on issues of universal design and play. You can learn more by visiting the Let's Play website: <http://letsplay.buffalo.edu/>

Dave

-
- **fading prompts with switch use** by **Lisa Berry** on Feb 24, 2005

Hi Dave,

Are you aware of any specific studies regarding using prompts to teach switch use?

Thank you,

Lisa

- **Re:fading prompts with switch use** by **Dave Edyburn** on Feb 26, 2005

Lisa:

Good question! Since I typically work with individuals with mild disabilities my knowledge of switches and switch research is limited. To try to answer your question, I decided to consult three sources: my database of the annual review of the literature, the excellent textbook by Cook & Hussey, and the new book, Handbook of Special Education Technology Research and Practice. What follows is a summary of what I found.

1. Annual review of the literature

In a message I posted to this web board on February 17 (what have we learned lately?), I described the work associated with my annual review of the literature. Over the past five years, my database has collected 12 citations concerning switches. As you will observe most deal with issues of practice. As a result, the most promising avenues for locating switch research appears to be: Cook & Cavalier, 1999; Zagler & Panek, 1999.

Cook, A.M., & Cavalier, A.R. (1999). Young children using assistive robotics for discovery and control. *Teaching Exceptional Children*, 31(5), 72-78.

Dahlquist, L. (2002). Using objects as symbols. *Closing the Gap*, 21(4), 6-7.

Hsieh, M-C., & Luo, C-H. (1999). Morse code text typing training of a teenager with

cerebral palsy using a six-switch morse keyboard. *Technology and Disability*, 10, 169-173.

Johnston, S.S. (2003). Making the most of single switch technology: A primer. *Journal of Special Education Technology*, 18(2), 47-50.

Lane, S.J., & Mistrett, S. (2002). Let's play! Assistive technology interventions for play. *Young Exceptional Children*, 5(2), 19-27.

Locke, P., & Wright, P., & Sagstetter, M. (2000). Bringing the world of voice to individuals with severe disabilities: Part 4 of 4: Access methods, switch assessment and symbol selection, *Closing the Gap*, 19(3), 6-7, 35.

Pellerito, F., & Mead, M. (1999). Free or inexpensive single-switch software solutions. *Closing the Gap*, 18(3), 1, 6-7, 28, 39.

Rocklodge, L.A., Peschong, L.A., Gillett, A.L., & Delohery, B.J. (1999). Low-end technology: Anyone can do it! *Special Education Technology Practice*, 1(1), 24-27.

Rocklodge, L.A., Peschong, L.A., Gillett, A.L., & Delohery, B.J. (1999). Creative solutions: Switch-hitting, part 1, *Special Education Technology Practice*, 1(2), 58-61.

Rocklodge, L.A., Peschong, L.A., Gillett, A.L., & Delohery, B.J. (1999). Creative solutions: Switch-hitting, part 2, *Special Education Technology Practice*, 1(3), 26-29.

Wise, P. (1999). Participating in high school and beyond: A six-pack for success. *Closing the Gap*, 17(6), 34-35.

Zagler, W.L., & Panek, P. (1999). Assisting the facilitators--interface design and telematic support for IT-based assistive technology. *Technology and Disability*, 10, 129-136.

2. Cook and Hussey

Cook, A.M, & Hussey, S.M. (2002). *Assistive technology: Principles and practice*. St. Louis, MO: Mosby.

I found a brief overview of switch access technology on pp. 239-247 but did not see any specific citations to research in this section.

3. HSETRP

The index of the *Handbook of Special Education Technology Research and Practice* had only two entries on switches. The following four citations were found in the context of alternative access to writing:

Feit, S. (2002). Assessment: Key to diversifying instruction. Proceedings of the CSUN Technology and Persons with Disabilities Conference. Retrieved November 28, 2002, from: <http://www.csun.edu/cod/conf2002/proddedings/70.htm>

Peake, P. (2002). Using Writing with Symbols 2000. Proceedings of the CSUN Technology and Persons with Disabilities Conference. Retrieved November 28, 2002, from: <http://www.csun.edu/cod/conf2002/proddedings/215.htm>.

Ray, L. (2002). Student authoring with IntelliPics Studio. Proceedings of the CSUN

Technology and Persons with Disabilities Conference. Retrieved November 28, 2002, from: <http://www.csun.edu/cod/conf2002/proddedings/73.htm>.

Ziejdel, C., & Fonner, K. (2002). Creating writing scaffolds in Clicker4. Proceedings of the CSUN Technology and Persons with Disabilities Conference. Retrieved November 28, 2002, from: <http://www.csun.edu/cod/conf2002/proddedings/293.htm>

I'm sure there is more research than I have been able to uncover in my brief search. However, I hope this helps for now.

Dave

- **Interpreting Research Results** by **Dave Edyburn** on Feb 25, 2005

Locating research is only part of the problem for those seeking to use research to improve educational practice. Another significant task involves reviewing and analyzing research studies to understand their relevance and quality. Many educational practioners are often challenged by the technical nature of this task.

The following resources have been designed to facilitate tasks associated with interpreting research. These tools are ideal for building the capacity of educational leaders to use research to inform decisions.

How to read a paper: Assessing the methodological quality of published papers
<http://bmj.bmjournals.com/cgi/content/full/315/7103/305>

A Policymaker's Primer on Education Research: How to understand, evaluate and use it
<http://www.ecs.org/html/educationIssues/Research/primer/index.asp>

Choosing Qualitative Research: A Primer for Technology Education Researchers
<http://scholar.lib.vt.edu/ejournals/JTE/v9n1/hoepfl.html>

Using research and reason in education: How teachers can use scientifically based research to make curricular and instructional decisions
<http://www.nifl.gov/partnershipforreading/publications/html/stanovich>

Making research accessible
<http://www.gtce.org.uk/research/berastudy.asp>

Edyburn, D.L. (2003). Assistive technology and evidence-based practice. ConnSense Bulletin. Available online: <http://www.connsensebulletin.com/edyatevidence.html>

- **Re: Interpreting Research Results** by **lisa berry** on Feb 28, 2005
Dave,

Thank you so much! This helps a lot. I've really enjoyed learning from you.

Lisa

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- **Utilizing Research to Improve Professional Practice** by **Dave Edyburn** on Feb 28, 2005

Ultimately, the value of the resources that have been identified on the webboard this past month need to be applied to the task of answering important questions about the use and value of assistive and instructional technology.

Clearly, we need to know more about the questions that educators want answered by the special education technology reserach knowlege base.

In addition, there are many questions we don't know the answer to. Some examples of interesting questions I have been pondering recently, include:

--Are there differences in assistive technology outcomes between students of different race/ethnic groups?

--Which is better, product X or product Y?

--How does the use of assistive technology impact students' reading achievement?

--What cognitive skill level is necessary to support voice recognition training?

In cases like these where the research base is insufficient to answer our queries, I believe it is important to consider the importance of classroom-based action research. Some useful resources include:

Action Research Resources

<http://www.scu.edu.au/schools/gcm/ar/arp/arphome.html>

Johnson, A.P. (2002). A short guide to action research. Boston: Allyn and Bacon.

Mills, G.E. (2000). Action research: A guide for the teacher researcher. Upper Saddle River, NJ: Merrill/Prentice Hall.

Stringer, Ernest T. (1996). Action research: A handbook for practitioners. Thousand Oaks, CA: Sage.

As I reflect on the journey we have made this past month, it seems we have come full circle: do we view our role as a producer or a consumer of research?

Dave

-
- **Excellent resource** by **KTJ** on Feb 28, 2005

Dave,

I just happened upon this online discussion and reviewed all of the postings. Dave, you are an excellent resource, a storehouse of information and I thank you for your willingness to share all that you have learned with those of us in the AT field.

This is a timely discussion for me as I have some research ideas that I'd like to explore and two books were recommended to me by my mentor, Madaleine Pugliese, - "The Craft of Research" and "Research in Education" by Best and Kahn. You have also posted numerous

articles and websites to review and I just want to thank you for all of your excellent, illuminating responses.

- **Kudos to Dave by Jackie Hess** on Mar 01, 2005
On behalf of the Family Center on Technology & Disability, and all of the people who have benefited from the discussion of this important topic, I'd like to thank Dave Edyburn for all of his great comments, resources, and responses to participants. You obviously expended a great deal of time and effort in moderating this discussion and we're grateful. See you at CSUN!
Jackie
-

Recommended Resources

No Child Left Behind

What is the achievement gap? Why is annual yearly progress (AYP) so important?

<http://www.ed.gov/nclb/>

No Child Left Behind: Implications for Assistive Technology

A fact sheet by Lisa Wahl for the Alliance for Technology Access analyzes the impact of NCLB for assistive technology.

<http://www.ataccess.org/resources/nochild.html>

Edyburn, D.L. (2004). **Consumer or producer of assistive technology research: Has NCLB altered your role?** *Closing the Gap*, 23(3), 12-13,24.

Outlines a strategy for creating collegial study groups to examine issues of NCLB, research, and assistive technology and our roles as producers vs. consumers of educational research. Provides readings and resources to facilitate four study group sessions.

Edyburn, D., Higgins, K., & Boone, R. (2005). **Handbook of special education technology research and practice**. Whitefish Bay, WI: Knowledge by Design, Inc.

<http://www.knowledge-by-design.com/HSETRPcatalog.pdf>