

# AT and Transition for Students with High Incidence Disabilities

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# Learning Objectives

- Identify two differences between how students with disabilities are supported in high school and college.
- Explain two fundamental obstacles facing a student with a print disability who comes to college without having used AT.
- Formulate at least one implication from this study for high schools regarding preparation of their students with disabilities for higher education.

# What is Assistive Technology?

Assistive Technology (AT) is any item or piece of equipment that is used to increase, maintain or improve the functional capabilities of individuals with disabilities in all aspects of life, including at school, at work, at home and in the community.

Assistive Technology ranges from no/low/light tech to high tech devices or equipment.



# Mission of Tools for Life

We're here to help Georgians with disabilities gain access to and acquisition of assistive technology devices and assistive technology services so they can live, learn, work, and play independently in the communities of their choice.



# Center for Inclusive Design & Innovation (CIDI)



CIDI is a research and service center that is part of the Georgia Tech College of Design.

Our mission has evolved to improve the human condition through equal access to technology-based and research-driven information, services, and products for individuals with disabilities in 35 states, territories as well as 3 countries.

# CIDI Products, Services and Research Initiatives



- Services

- E-Content Engineering
- Braille
- Remote Captioning | Transcription
- Assistive Technology Evaluations
- ICT Audits and User Testing
- Training and Technical Assistance
- Student Accommodation Data Manager

- Assistive Technology Cost Savings

- National technology co-op
- 24 technology applications
- 6,541 technology downloads

- Formats, Reuse and Cost Savings

- AMAC's repository contains over 45,000 accessible textbooks
- 19 unique electronic media formats
- 45 percent re-usage
- \$99 average book conversion cost (compared to \$299 in 2001)
- Prison Braille Programs in Georgia and Texas (\$2.00 per page versus \$8.00)

# What Do We Know About Students with High-Incidence Disabilities?

High-incidence disabilities include:

- learning disabilities,
- emotional-behavior disorders,
- mild intellectual disabilities,
- attention deficit/hyperactivity disorder
- sometimes high functioning autism
  - (Murray & Pianta, 2007).



# What Do We Know About Students with High-Incidence Disabilities?<sup>(2)</sup>

Many students with high-incidence disabilities face challenges associated with:

- Literacy (i.e., reading and writing) as well as mathematics (Murray, 2002).
- Executive functioning
  - Postsecondary level: required to become primary decision maker
  - Different environment: no IEP/ 504 Plan



# AT and Students with High-Incidence Disabilities<sup>(1)</sup>

## Disadvantages of AT for Students with High-Incidence Disabilities

- stigmatization
- cost
- lack of connection to student's use of everyday technology
  - (Parette & Scherer, 2004).

# AT and Students with High-Incidence Disabilities<sup>(2)</sup>

Problems associated with AT use for students with special education needs include

- availability of resources
- lack of knowledge
- abandonment
  - (Mavrou et al., 2019; Malcolm & Roll 2017; Brown, 2005; Parette & Scherer, 2004).

# AT and Students with High-Incidence Disabilities<sup>(3)</sup>

**Students with high incidence disabilities represent about 70% of all students' with disabilities (Aud et al., 2011; Raue & Lewis, 2011).**

**Students with high incidence disabilities have low rates of AT use (Malcolm & Roll 2017; Newman and Madaus 2015); Lightner, Vaughan, Schulte, & Trice, 2012; Kaye, Yeager, & Reed, 2008; Woodward & Reith, 1997).**

**High rates of abandonment are persistent issues (Kaye et al., 2008; La Plante, Hendershot, & Moss, 1992; Ofiesh, Rice, Long, Merchant, & Gajar, 2002; Phillips & Zhao, 1993; Woodward & Reith, 1997).**

# National Longitudinal Transition Study (NLTS2)



Compared post-secondary outcomes of students with high incidence disabilities who reported receiving Assistive Technology (AT) in high school to those who reported not receiving AT.

Study included 305,000+ students.

The results focused on understanding issues of AT for secondary (i.e., high school) students with Disabilities).

- suggest low rates of self-reported and educator-reported AT access and/or use for secondary students with disabilities
- higher rates of AT for secondary students with more low-incidence disabilities than students with more high-incidence disabilities.
- Bouck, E. (2016). A National Snapshot of Assistive Technology for Students With Disabilities, *Journal of Special Education Technology*, 2016, Vol. 31(1) 4-13

# National Longitudinal Transition Study (NLTS2) (2)



- Students with high-incidence disabilities who reported receiving assistive technology in school had more positive post-school outcomes in terms of a paid job, wages, and participation in postsecondary education.
- Although positive implications for receipt of assistive technology in school were suggested, receipt was not a predictor for positive post-school outcomes.
- Bouck, E., Maeda, Y., & Flanagan, S., (2012). Assistive Technology and Students With High-incidence Disabilities: Understanding the Relationship Through the NLTS2, *Remedial and Special Education*, 33(5) 298–308.

# National Longitudinal Transition Study (NLTS2) (3)



According to the National Longitudinal Transition Study(NLTS2) - 2012:

- 99.8% of the students who received AT graduated
- Only 79.6% of those who did not receive AT graduated.
- 80.9% of students who received AT attended a post-secondary institution
- Only 40.1% of students who did not receive AT attended a post-secondary institution.
- 80% of those who received AT had a paying job after high school
- Only 50.8% of those who did not receive AT had a paying job.

# National Longitudinal Transition Study (NLTS2) (4)



- Only 7.8% of students with high-incidence disabilities reported receiving AT in high school (NLTS2).
- Most frequently recommended AT: calculator – followed (distantly) by laptop and audible books (NLTS2).



# This decade: Has AT use increased?

Since the Longitudinal Study ended (2010) we have the sense that there has been an increase in use of:

- Technology for Reading
    - Screen Reading Software (Text-to-Speech)
    - Speech Recognition (Speech-to-Text)
    - Electronic Dictionaries
  - Technology for Writing
    - Talking Word Processors
    - Talking spell-checkers
    - Word Prediction
    - Digital graphic organizers
- (Alper & Raharinirina, 2006)

# This decade: SWHID in Higher Ed.



- Enrollment rate of students with disabilities, is increasing at an unprecedented rate (Barnard-Brak et al. 2010; Brown and DiGaldo 2011; Snyder TD, Dillow SA. Digest of Education Statistics, 2012, National Center of Education Statistics., 2013)
- Many SWHID come to campus lacking the preparation required to meet the rigorous standards of college (Hall, 2017; Francis, Duke, Bringham, & Demetro, 2018)
- Only 20% of college students with disabilities successfully graduate from 4-year institutions (Grogan 2015).
- AT identified as one the most important services that contribute to SWHID ability to remain in college (Getzel, 2008; Cawthorn & Cole, 2010, Summers et al. 2014; Hall, 2017; Francis, Duke, Bringham, & Demetro, 2018)

# Poudel Study (2014): Mastery of AT

Poudel (2014) studied 17 students with high incidence disabilities (LD, ADHD, etc.) in HS and college to discover acceptance and use of AT.

Importance of earlier exploration and start of AT to support academic learning:

After being in college, the students found college course loads and professors' expectations to be more demanding compared to their high school.

Due to the increased course load, more time was required to learn the subject matter, and thus, they perceived a need to use possible technology.

# Poudel Study (Cont.)

Experienced users of AT reported:

- immense improvements in their academic performance
- getting better grades over time
- comprehending the subjects at the depth that they would have never been able to if they were not using AT
- AT positively influenced their sense of competence in other areas of learning
- Students who were more reluctant about using AT to support their learning did not express any improved competence
- AT use over time supports Independence:
- The use of AT over the years also seemed to improve some of their academic skills
- Students indicated that they did not have to be as dependent on AT as they used to.

## Background

Assistive technology (AT) is proving to be a staple tool that students with disabilities are using to achieve success in post-secondary settings.

Students who qualify have access to textbooks in electronic format.

Students use computer and tablet-based software to help them read their textbooks and gain comprehension.

It has been assumed that students who have learned to use these AT tools while still in high school may have a distinct advantage over students who come to college without having experience with these tools.

However there is little evidence to confirm this assumption.

### Research Questions

In order to examine this assumption and to gain insight into the use of AT by college students, we propose to invite students who have made use of the AMAC services since 2014 to take part in a survey to determine the following:

- What percentage of students with disabilities who are referred to AMAC are coming prepared to use AT?
- How successful are these students in college?
- How does the success of these students who come prepared to use AT compare to the success level of students who are not prepared to use AT?
- Have the AT services provided by AMAC been effective and helpful to these students?

## AMAC Study (3)

### Participants:

The participants located primarily in the State of Georgia, but may include students who reside in other states.

Participants came from list of students who were

- referred to AMAC by their local college Office of Disability Services
- and who received classroom materials in alternative media.

The number of students invited was approximately 1570.

The pool of participants included both male and female, and ranged in ages from 19 to 25.

Participants represented a broad range of ethnic backgrounds including: African-American, Asian, Caucasian, and Hispanic.

The students in this pool will included individuals with learning disabilities (dyslexia, dysgraphia, etc), autism, adhd)



# AMAC Study (4)

## The survey:

Was conducted online.

- employed a web-based survey tool (Qualtrics).
- consisted of 27 questions.

Was divided into three parts:

1. high school experiences,
2. post-secondary experiences, and
3. personal reflections on their use of AT

Questions were in one of 3 forms:

1. Likert Scale with 5 choices
2. check-off lists/ short-answer

# Participants by Disability

Learning Disability 66%

ADHD 19%

Autism 6%

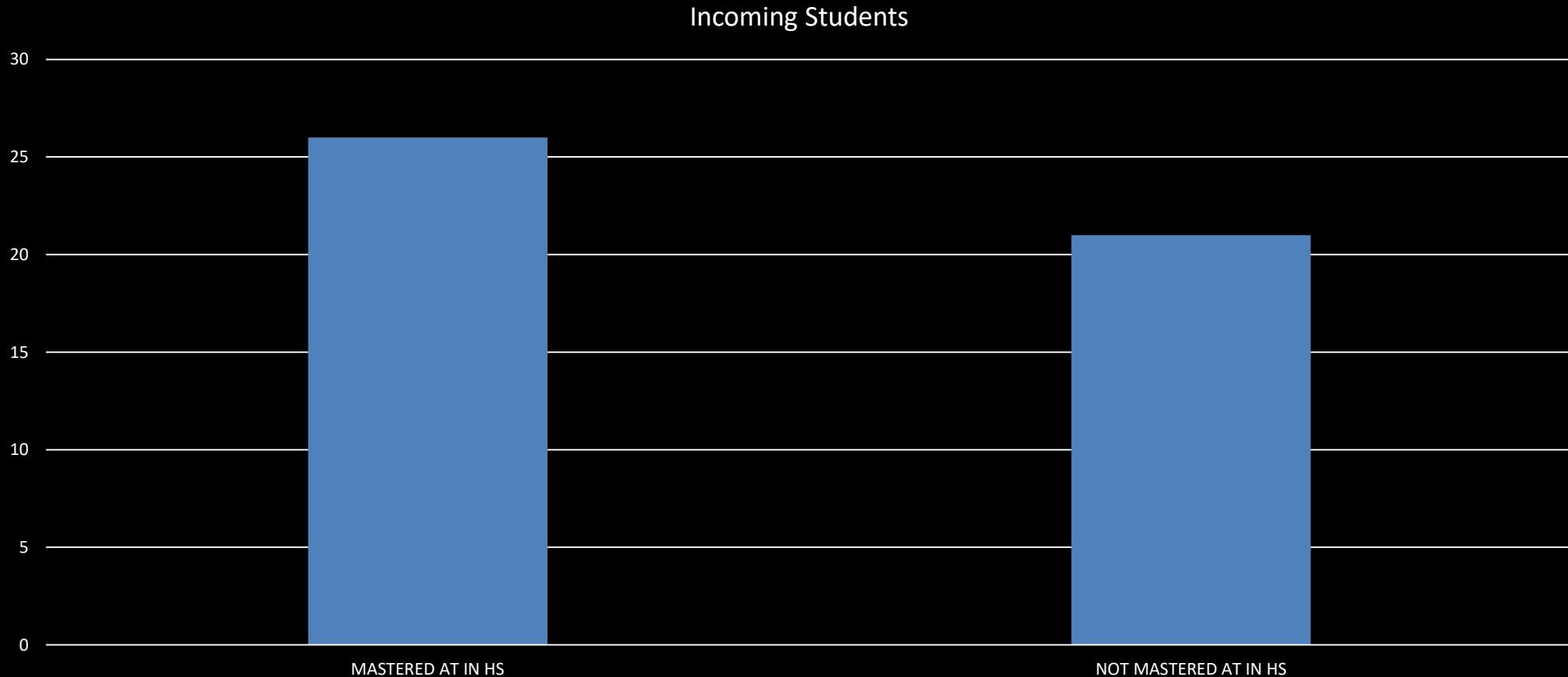
Other 23%

N=47 (some individuals identified with multiple disabilities)

# What percentage of students referred to CIDI/ AMAC are coming prepared to use AT?

55% coming with mastery of AT

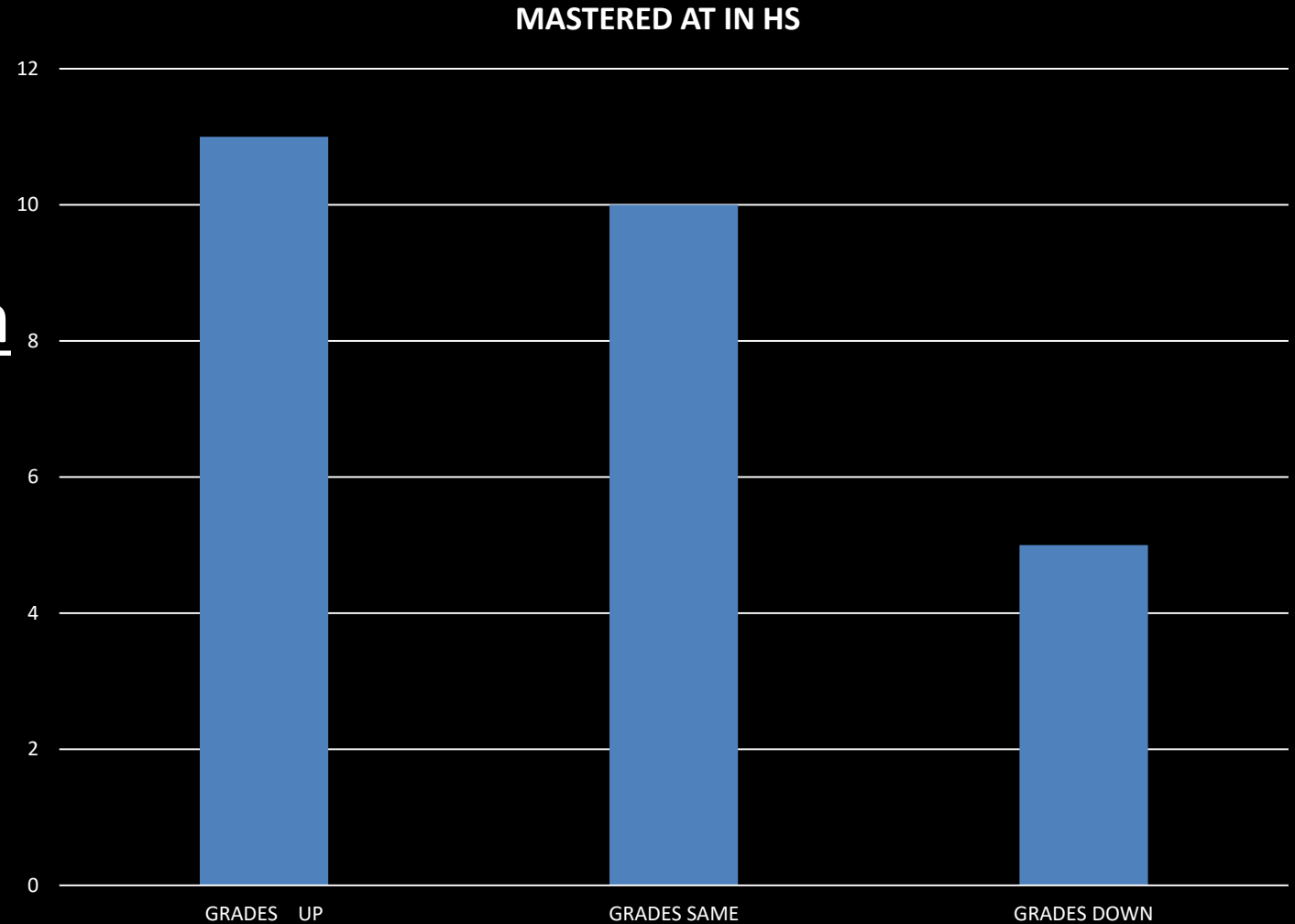
45% coming without mastery of AT



# How successful were students who MASTERED AT in post-secondary settings?

Change in grade point average from High School to Post-Secondary among students who mastered AT in high school:

GPA went up 42%,  
GPA showed no change 38%  
GPA went down 19%



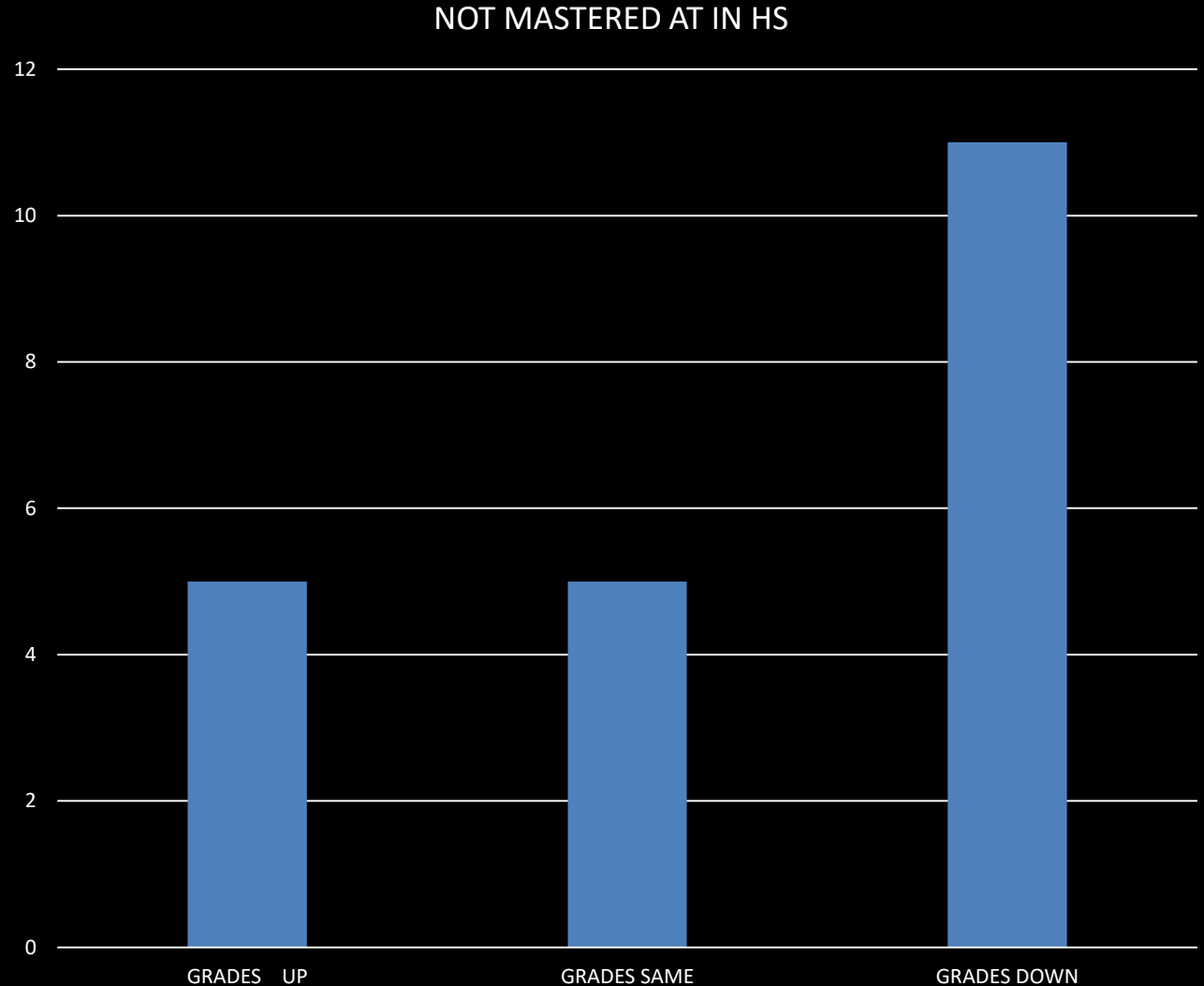
# How successful were students who DID NOT MASTER AT in post-secondary settings?

Change in grade point average from High School to Post-Secondary among students who had not mastered AT in high school:

GPA went Up 24%

GPA showed no Change 24%

GPA went down 52%

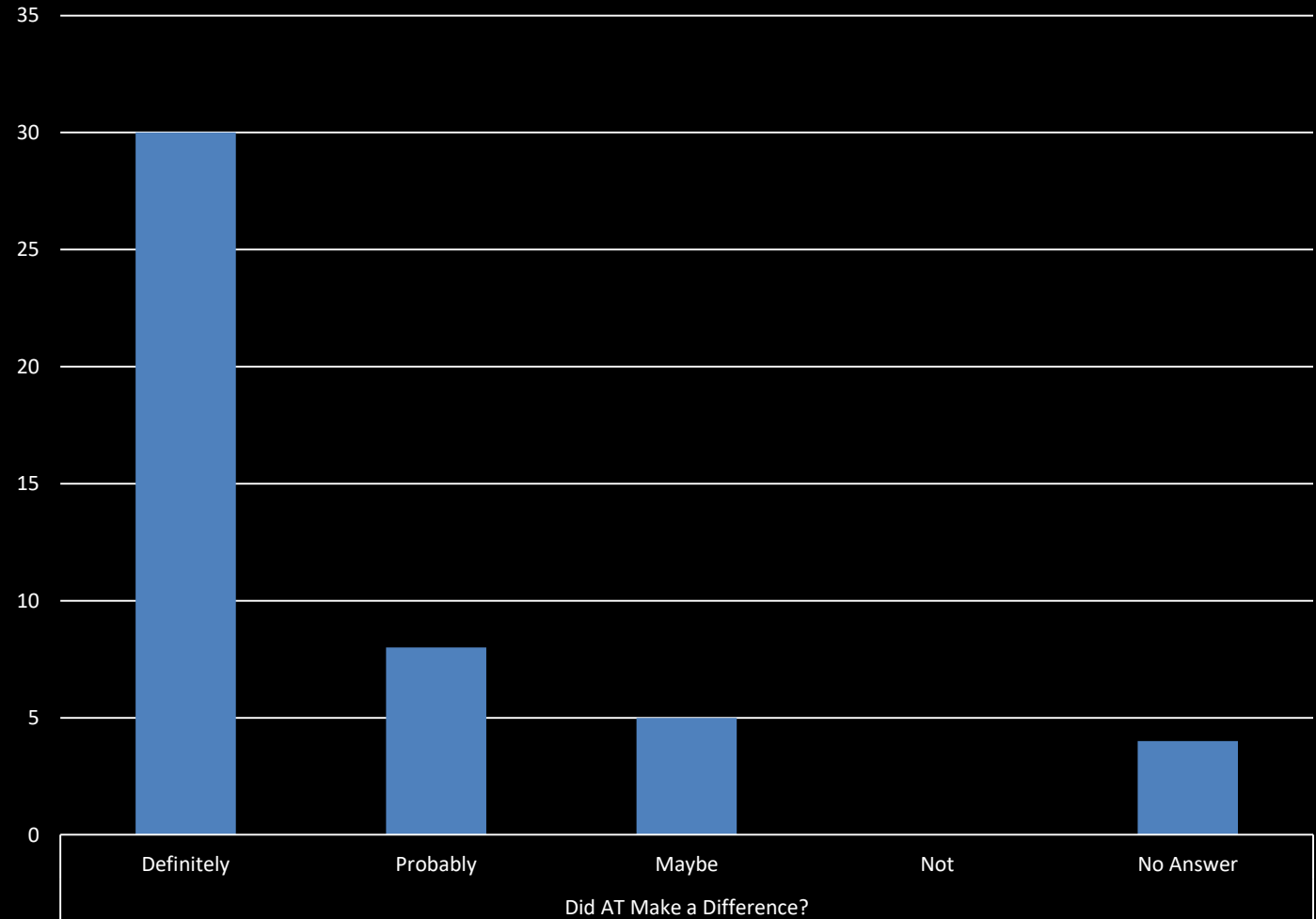


# Did Students Feel AT Made a Difference?

Among all participants:

- Definitely 64%,
- Probably 17%,
- Maybe 10%,
- Not 0%,
- No Answer 8.5%

## Did AT Make a Difference?



# How did you learn how to use the AT tools that helped you?

Self-taught 68%

Office of Disability Services 47%

Directly from AMAC 17%

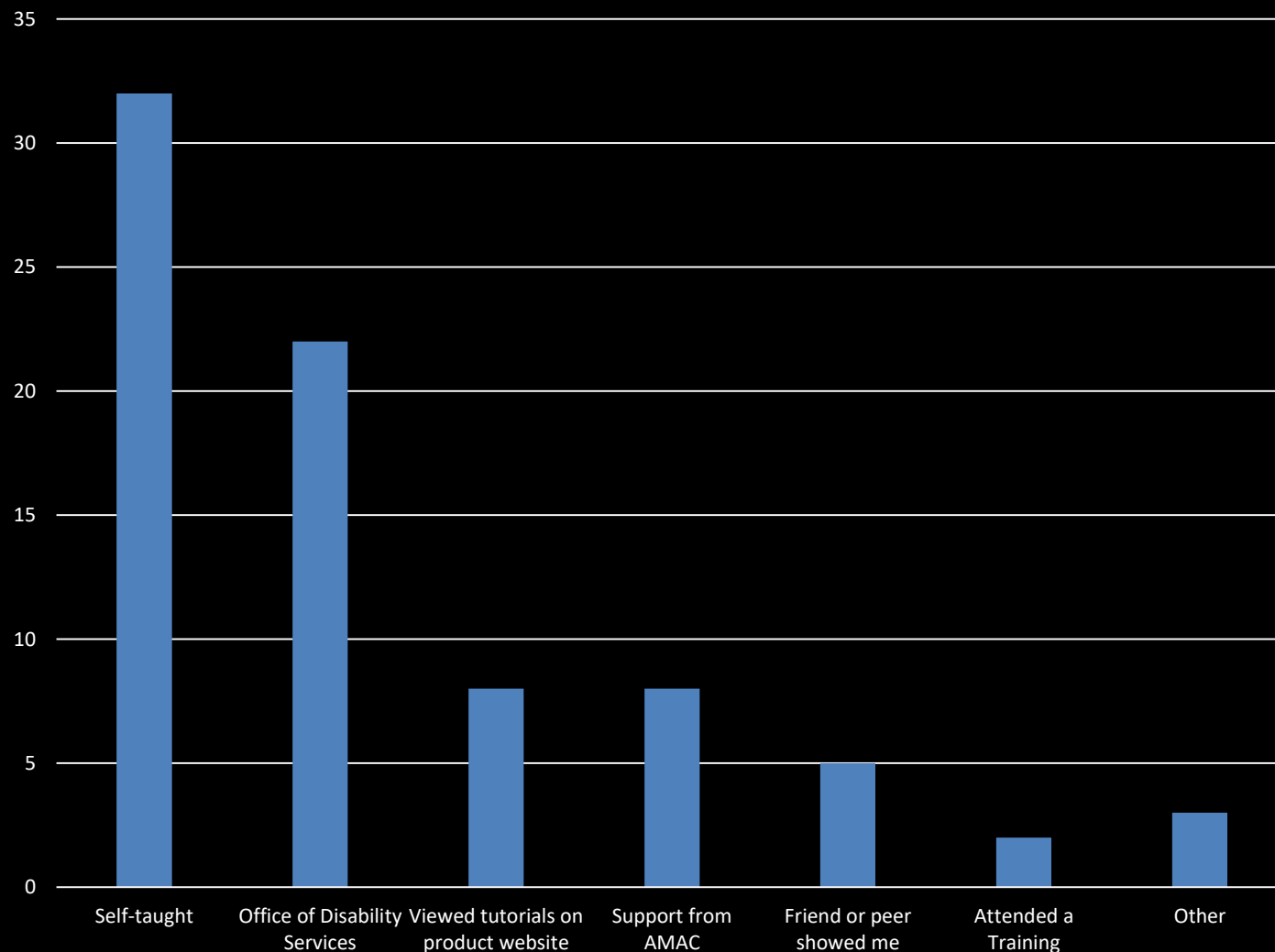
Tutorials on product website 17%

Friend or peer 5%

Training 2%

Other 6%

## How did you learn how to use your AT tools?





# What AT Was Provided in HS?



	Available	Used
Calculator	76.60%	65.96%
Spell checker	38.30%	29.79%
Screen reader (text-to-speech software)	25.53%	12.77%
Audible text books	23.40%	21.28%
Audio recorder	17.02%	12.77%
Magnification/ enlargement tools	8.51%	6.38%
Word prediction	6.38%	8.51%
Graphic organizer	6.38%	4.26%
Speech recognition (speech-to-text software)	12.77%	8.51%
Electronic dictionary	10.64%	6.38%
Talking word processor	2.13%	2.13%
Other	1.13%	0.00%
None of these	14.89%	23.40%

# QUESTIONS



## AMAC Study: Participant Comments

“My grades and gpa has [sic] gone up dramatically with the [AT] I have been given.”

“It helped make learning in college easier to understand.”

“By listening and reading the information at the same time, I'm able to manage my studies in a reasonable amount of time, as the audio presses me to process faster, rather than the previous situation where I would stay up to the middle of the night only half finished, though understanding perfectly fine, due simply to the slow speed at which I process the information.”

## AMAC Study: Participant Comments (2)



“Typing is excruciatingly painful for me; I don't think I would've been able to write the required essays in my intro humanities courses without the use of speech recognition technology.

Now i use assistive technology and my grades have improved.”

## AMAC Study: Participant Comments (4)



“I feel [AT] should be more readily available to students from the time they are diagnosed through their entire education in order to better enable them for a successful education and learning environment.”

“... was a life saver when came to time it took for to read a section within a textbook.”

“...helped my productivity and accuracy.”

“I could not have done it without the assistive technology.”

## AMAC Study: Participant Comments (3)



“Without spell check I would have actually failed all my classes.”

“I would not be able to pass courses without extended time and audio recordings.”

“It helps me process things faster so I do not fall behind.”

“Audiobooks help me to more quickly and effectively read material.”

“It helped me keep up with the lectures.”

# How would you describe your first year of college/tech school?

Easy	11 %
Straightforward	21 %
I had to work at it	34 %
It was hard	17%
It was very hard	15 %
No answer	2 %

# How difficult was each of the following tasks for you in college/tech school?



	Reading	Writing	Computation	Note Taking	Test Taking
Real Easy	11%	15%	16%	16%	9%
Sort of Easy	20%	13%	20%	20%	13%
Had to Work	18%	17%	29%	20%	24%
Hard	27%	33%	22%	31%	31%
Real Hard	24%	22%	13%	13%	22%



# How difficult was each of the following subjects for you in college/tech school?

	<b>English/ Lang. Arts</b>	<b>Math</b>	<b>Science</b>	<b>Social Studies</b>
<b>Easy</b>	12%	21%	21%	17%
<b>Sort of Easy</b>	29%	14%	30%	38%
<b>Had to Work</b>	33%	19%	23%	26%
<b>Hard</b>	14%	16%	16%	10%
<b>Real Hard</b>	12%	30%	9%	10%

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# Disclaimer

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# Impact of AT on Unaided Reading

Univ. Hawaii controlled study (Park, Takahashi, Roberts & Delise, 2017)

134 struggling 9<sup>th</sup> grade readers

10 weeks of screen reading (TTS with highlighted reading) yielded significant, positive impacts upon:

- Reading vocabulary (unaided)
- Reading comprehension (unaided)

# Impact of AT on Unaided Reading (2)

Stodden, et.al., (2012) 2 pilot studies:

High school students with High-incidence Disabilities

Reading at/below 6<sup>th</sup> grade GLE

1 semester of screen reading (40 mins per week) yielded significant, positive impacts upon:

- Reading vocabulary (unaided)
- Reading comprehension (unaided)
- Reading rates (unaided)

Average total reading scores increased by 1.99 GLE

...compared to baseline scores