Access Academy

AMERICAN PRINTING HOUSE

Accessing the Visual Environment: Successful Outcomes

Tara Bowie

- Outreach Education Program Specialist
- Georgia Department of Education
- Office of State Schools
- Smokey Powell Center

Access Academy

AMERICAN PRINTING HOUSE

Cindy Bachofer

- Low Vision Consultant
- Texas School for the Blind
- and Visually Impaired
- Austin, TX

Access Academy

AMERICAN PRINTING HOUSE

Jodi Floyd

- Statewide Blind and Visually Impaired Education, Outreach Division
- South Carolina School for the Deaf and the Blind

Alicia Wolfe

- American Printing House for the Blind
- Outreach Specialist – Southeast Region
- Teacher of Students with Visual Impairments

Quick Overview of Optical Devices

Optical Devices

- **Designed to improve visual performance in individuals with low vision**
- **Can be low or high tech**
- **Common categories:**
  - Stand magnifier
  - Hand-held magnifier
  - Digital magnifier
  - High-powered reading glasses
  - Video/CCTV magnifier (near/ distance, or near)
  - Monocular/ Telescope
  - Wearable devices

Handheld Optical Devices

- Extended viewing: Optical lens vs. camera
- Range of focusing needs (variety of targets)
- Speed of access (count the steps needed)
- Independence across settings (*Pride in specialized skill)

Access Academy

AMERICAN PRINTING HOUSE

Stand Magnifier

- Non-digital magnifier that rests away from the paper but at a fixed focal distance
- Not useful for long sustained periods of reading
- Fixed power, not adjustable
- Allows the individual use of both hands and is good for those with motor control issues
- Often has a light to provide additional magnification

Hand-Held Magnifier

- Non-digital magnifier that can be held in the hand
- Focal distance is adjusted by the distance from the paper and the distance from the eye
- Fixed power, not adjustable
- Not useful for sustained reading

Digital Magnifier

- Hand-held but generally has a built-in stand
- Portable but must be charged daily if used consistently throughout the day
- Allows for adjustment of color, contrast, and magnification level
- Different screen sizes available (5-, 7-, and 10-inch models)
- Name Brands
  - APH Video Mag HD, Visolux, Smartlux, Pebble, Candy, Compact

High-powered Reading Glasses

- Truly a hands-free (wearable) magnifier (increase reading speed!)
- Very close work (reading) distance, need time to adjust
- Daily practice sessions to build tolerance and stamina for sustained reading

Access Academy

AMERICAN PRINTING HOUSE

Video Magnifier (near/distance or near)

- Closed Circuit Television System (CCTV); stationary or portable models
- Digital magnification that uses a camera to project an image on a monitor
- Allows for adjustment of color, contrast, and magnification level
- Some models may have Optical Character Recognition (OCR) features
- Depending on model, can magnify both near and distance images
- Portable but depending on model may have to be plugged in at each location

Monocular/ Telescope

- Monocular/ Telescopes magnify objects in the distance
- Convenient to carry, pocket-sized, and light weight.
- Available in a variety of sizes and magnification levels
- Ideal for middle and far distance viewing

Wearable Systems

- Bioptic – Telescopic lens system has a mounted telescope on carrier frame for distance viewing (e.g., driving)
- Smart glasses- AI-powered using a camera and speaker to identify objects, faces, surroundings

Game changer-the smart phone

- Socially acceptable tool
- Built-in access
- Motivation to use
- Add on devices/Apps
- "It's the *only* thing I use."

Challenges with the screen view

- Recharging necessary for frequent camera, media use
- Limits with expanding picture for detail view (over-pixelated image)
- Glare on screen with outdoor viewing
- Extended screen time concerns (e.g., eye strain, sleep cycle)
- No-phone zone at school, work now common

Setting Students up for Success

Access Academy

AMERICAN PRINTING HOUSE

Device Abandonment →Ownership

D Durability

E – Ease of Use

C - Cost

I – Involved in process

D - Dependability

E - Effectiveness

Student Roadblocks to Device Use

- Conscious of peer reactions (perceived, direct)
- Device use doesn’t equalize things
- Doesn’t get “benefit” of device, lack of visual curiosity
- Lack of support to build use as a habit
- Low expectations, limited accountability
- Training issues (e.g., inconsistent, insufficient)

Breaking Down Roadblocks

- Include the student in the decision to get a device
- Capitalize on student interests
- Use age-appropriate activities
- Find out the families' activities for integrating use into home and community
  - Keep up-to-date on fads across age groups
  - Meet up with other students

The Three M's

- Motivation to use
- Matching the user to the tool
- Managing the task successfully

Motivation

- High expectations
- High interest
- High success

Matching the User to the Device

- Power, distance, and size
  - What's my power? (3x/12D mag; 6x16 scope, 9° field)
  - How far away and how big is my target?
- Concepts of magnification
  - Relationship between the device lens and field of view (field of view = ease of use)
  - Importance of work distance (E↔L↔M) Eye to lens; Lens to material/target
- More light or less light

Managing the Task

- Confidence (internal sense of competence)
- Efficiency (skill & speed alongside peers)
- Responsibility (self-initiation of task)

Access Academy

AMERICAN PRINTING HOUSE

Value of Optical Devices Along the Continuum of Technology

A → Available

V → Versatile

A → Affordable

D → Durable

Training Students to Use Optical Devices

What do you like to look at for Near?

Activities for Students:

- Pre-school to early elementary
- Middle school to high school
- Transition age/adult

Overview of Sequence of Skills for Device Use

Near Devices

- Fixation
- Localization
- Focal distance
- Scanning
- Tracking

Distance Devices

- Localization
- Fixation/Focusing
- Spotting
- Scanning
- Tracing
- Tracking

AMERICAN PRINTING HOUSE

Beginner →Apprentice →Master

- Localizing
- Focusing
- Spotting
- Scanning
- Tracing
- Tracking

- Build speed, stamina
- Stretch into new settings
- Anticipate more challenging tasks
- Practice comfortable wording to explain to others

AMERICAN PRINTING HOUSE

Vocabulary of Optical Device Use

- Localizing: Visually selecting an object from objects around it such as seeing the street sign against the row of trees
- Focusing: Bringing an image into clearest view by adjusting the distance of the lens on your device to your target information
- Spotting: Visually targeting an item to see through your device, then lining up the device lens with your eye to see detail

Vocabulary of Optical Device Use

- Scanning: Repeated fixations with your eye that let you see one item after another such as following words across a line of print
- Tracing: Visually following a line in space to locate an object such as the edge of a sign to find the letters at the top
- Tracking: Visually following a moving object such as a rolling ball

Access Academy

AMERICAN PRINTING HOUSE

Near Skills for Magnifier Use

- Magnifiers
  - –Find the sweet spot of focus (eye-to-lens; lens-to-target)
  - –Stabilize your holding hand
  - –Use a line guide, sticky note to mark your spot
  - –Build stamina with daily practice, specific tasks
  - –Keep a record (reading time/speed, variety of uses)

Spot reading with a Magnifier

- Use a search pattern to select target area
- Note bold headings, chunked text
- Select spotting tasks with increased challenges (video game case, expiration date on food packages

Scanning text: Repetitive fixations required to look from one target to another

- Maintain steady fixation
- Reduce clutter- start with double-spaced text
- Use a consistent pattern (orientation on the line)
  - Use reliable method for stabilizing material
  - Start with a stand magnifier, move to handheld
  - Make it fun at first with games, picture, icons, sports symbols

Access Academy

AMERICAN PRINTING HOUSE

More (very important) tools

- Lighting is *everything!*
- Use of a slant board
- Medium point or gel tip pens and lead pencils (art store)
- Ergonomic checklist

Access Academy

AMERICAN PRINTING HOUSE

What do you like to look at for Distance?

Activities for Students:

- Pre-school to early elementary
- Middle school to high school

Transition age/adult

Access Academy

AMERICAN PRINTING HOUSE

Distance Skills for Monocular/telescope Use

Telescopes

- Find an object through the scope (big, bold)
- Stabilize your holding hand for a steady vie
- Set focus by changing the barrel from short to longer
- Stay fixed on an object or follow a moving one

Sequence of Skills for Distance Device Use

Localization

Fixation/Focusing

Spotting

Scanning

Tracing

Tracking

Beginner →Apprentice →Master

- Localizing
- Focusing
- Spotting
- Scanning
- Tracing
- Tracking

- Build speed, stamina
- Stretch into new settings
- Anticipate more challenging tasks
- Practice comfortable wording to explain to others

AMERICAN PRINTING HOUSE

Focusing: Bringing an image into clearest view

- Demonstrate blur and clear on a CCTV
- Transfer this concept to the telescope
- Practice “opening” the barrel of the scope *while looking through it* to show blur and then clear
- Practice on targets at increasing distances
- Set up repeated spotting and focusing tasks to build speed in identifying the target

Localizing, then spotting

- Finding a target amidst the clutter

IEP Goals and Progress Monitoring for Near & Distance Devices

Present Levels and Individualized Education Plan Goals

- Add information to the Present levels of the IEP based on the information provided in the exam
- Add goals depending on the device recommendations
- Goals should be focused on skills needed to operate any magnifier or monocular not a specific device

Access Academy

AMERICAN PRINTING HOUSE

IEP Goals

- Pre- and Post-testing is key!
  - Need a baseline to establish current level
- Establishing benchmarks or targets
  - For clarity and consistency and instructional planning
  - Ask: What device is the student being trained to do? What activities are being targeted? What specific skills need to be addressed?
  - Skills measured can be broad or narrow in scope

Potential Skills to Monitor

Near

- Communicate the purpose of the magnifier
- Stabilize the material
- Read a variety of print formats
- Develop stamina for the duration of age-appropriate tasks

Distance

- Cleans the monocular correctly
- Identify if the monocular is in focus
- Locates, identifies, and examines stationary items
- Tracks with the monocular to follow moving targets

AMERICAN PRINTING HOUSE

Sample Measurable Goals--Near

- The student will demonstrate the ability to independently identify, handle, and store a magnifier correctly in 4 out of 5 opportunities across multiple settings.
- The student will use a magnifier to complete near-vision reading tasks (e.g., reading worksheets, books, or labels) with 80% accuracy across three consecutive sessions.
- The student will independently choose and use the appropriate magnifier for a variety of academic tasks (e.g., reading instructions, identifying labels, completing worksheets) in 4 out of 5 trials.
- The student will demonstrate proper handling and care for the magnifier in 4/5 trials.

Sample Measurable Goals-Near

- The student will select the appropriate magnifier based on task size or distance in 3/4 opportunities.
- The student will use the magnifier for at least 10 continuous minutes during a reading or academic task with minimal redirection.
- The student will self-advocate for magnifier use in unfamiliar tasks or settings in 3 out of 4 opportunities.
- The student will position the magnifier appropriately for reading printed text with correct focal distance in 4/5 trials.
- The student will increase reading fluency from a baseline of xx words per minute to xx words per minute as measured by an informal reading inventory.

Sample Measurable Goals--Distance

- The student will increase independent and efficient use of a monocular to access distance visual information in educational settings.
- The student will correctly align and focus the monocular on targets (e.g., whiteboard, classroom posters) within 3–5 seconds with 80% accuracy over 5 trials.
- The student will identify and describe visual information (e.g., written text, symbols) viewed through the monocular from 10–15 feet with 80% accuracy.
- The student will independently retrieve, use, and store the monocular during class transitions with minimal prompts in 4 out of 5 opportunities.
- The student will demonstrate understanding of when and why to use the monocular in real-world and school contexts in 4 out of 5 scenarios.

Sample Measurable Goals- Distance

- The student will locate room numbers, signs, or schedules using a monocular with 90% accuracy in at least 3 different school settings.
- The student will use a monocular to locate and identify peers or staff from a distance of 15–20 feet in unstructured environments in 4 out of 5 trials.
- The student will initiate monocular use without teacher prompts in appropriate settings 80% of the time.
- The student will explain how environmental lighting and contrast affect monocular effectiveness and describe strategies to adapt.
- The student will explain the purpose of the monocular and how it supports access to learning in a peer-friendly manner in 3 out of 4 role-play situations.
- The student will reflect on and describe situations where monocular use was or was not helpful and suggest alternatives in writing or discussion in 4 out of 5 reflections.

Monitoring Progress

- Different time frames depending on IEP team, district, and state requirements.
- Recommended: Done every time the student works on that skill
  - More data is collected
  - Growth is shown progressively and steadily
  - Instruction can be adjusted quickly

Access Academy

AMERICAN PRINTING HOUSE

Aids to Monitor Progress

- Envision Checklist for Near and Distance Magnification
  - Comes with the kit and includes a pre- and post-test for magnifier and monocular skills
- Published Magnifier or Monocular Skills Checklists
  - Paths to Literacy, APH (Jupiter, MATT Connect), Teachers Pay Teachers
- Teacher Made Checklist
  - Make your own based on specific skills the student needs to acquire

Adjusting Instruction

- Simple activities to train basic skills
  - Both free and paid material for magnifier skills training
- For students with additional disabilities or young students using a device for the first time
  - Set the focal distance on a monocular and tape it
  - Place a line of black tape on the bottom of a dome magnifier to provide a line guide
  - Consider a wearable device for students with motor difficulties

Resources

- Monocular & Magnifier Training Documents (Bachofer & Tabb) (free)
  - https://www.pathstoliteracy.org/resource/monocular-and-magnifier-training-documents/
- APH (free)
  - Google Search APH Jupiter Skills Performance Checklist or MATT Connect Performance Checklist
- Project Magnify (free)
  - Checklist developed by SC Project Magnify to progress monitor individuals in the program

Bridging the Clinical Low Vision Evaluation with the Functional Vision & Learning Media Assessments

After Low Vision Devices are Prescribed and Initial Training is Completed

Access Academy

AMERICAN PRINTING HOUSE

Role of the Functional Vision Assessment

- How does the learner use their vision in everyday activities?
  - Strengths? Challenges?
- Assists with determining impact on learning
- Accommodations & teaching strategies

Access Academy

AMERICAN PRINTING HOUSE

Role of the Learning Media Assessment

- Sensory channels
- Types of general learning media
- Literacy media (reading, writing)
- Assistive Technology
  - Low-tech and high-tech tools
- Literacy programs/pathways

FVA + LMA: Foundations for Instruction, Services, and Access

- Determine the appropriate learning media
- Recognize the most effective way for learner to access information
- Identify specific accommodations to support access
- Develop realistic, measurable IEP goals
- Decide type and intensity of services

Access Academy

AMERICAN PRINTING HOUSE

Staying Responsive: Updating the FVA and LMA as Learner Needs Evolve

Key Moments for Updating FVA & LMA

- At least every 3 years
- Significant change in learner's vision, behavior, or academic performance
- New tools, devices, or instructional strategies are introduced
  - **Devices prescribed from a Clinical Low Vision Evaluation**
- Change in educational setting or grade level

From Clinic To Classroom

"Research of students with low vision indicates that about 70% of students experience **an improvement in visual functioning** and **increased access to a wider range of literacy materials** if prescribed the correct optical and/or non-optical device in a low vision evaluation."

(Hofstetter, 1991)

Access Academy

AMERICAN PRINTING HOUSE

Clinical LVE Data Matters in the FVA & LMA

- Bridges medical and educational perspectives
- Informs appropriate learning and literacy media and tools
- Supports individualized recommendations
- Promotes device integration and skill building
- Ensures data-driven decision making for learners

Access Academy

AMERICAN PRINTING HOUSE

Strengthen FVA & LMA with Clinical Insights

- **Incorporate clinical LVE data**
- **Prescribed lenses**
- **Prescribed low vision devices** (in simple terms)
  - Hand-held, spectacle-mounted, or clip-on
  - Monocular or binocular

Access Academy

AMERICAN PRINTING HOUSE

Strengthen FVA & LMA with Clinical Insights

- **Non-optical aids**
  - Lighting control, Enhanced contrast
  - Reduction of glare
  - Improving physical comfort (accessories)

- **Device trials, training recommendations**

Access Academy

AMERICAN PRINTING HOUSE

Revisiting the Functional Vision Assessment: Responding to Change

After Low Vision Devices are Prescribed and Initial Training is Completed

Keeping the FVA Current

"The FVA should **complement** a clinical low vision evaluation." (D'Andrea, 2000)

Capturing Functional Vision Growth in FVA

- **Feedback** from learner's multi-disciplinary team including caregivers and family members
- **Observations** of the learner using the device(s) in real settings, across various environments

Key FVA Components Change Post-LVE

- **Comparisons to baseline functional vision before device use**
  - Functional near visual acuity
  - Functional distance visual acuity

Key FVA Components Change Post-LVE

- **Visual Attention and Tracking**
  - Has visual attention improved with magnification?
  - Can the learner maintain better focus across a page or board?
- **Lighting and Contrast Preferences**
  - Is learner more aware of preferred lighting conditions?
  - Recommendations for contrast enhancement or glare reduction?

Key FVA Components Change Post-LVE

- **Visual Behaviors**
  - Change in eye strain, fatigue, posture?
  - Engaged in visual activities previously avoided?
- **Accommodations**

Revisiting the Learning Media Assessment: Responding to Change

After Low Vision Devices are Prescribed and Initial Training is Completed

Access Academy

AMERICAN PRINTING HOUSE

Key LMA Components Change Post-LVE

- **Near Visual Efficiency (Size and Distance)**
  - Access smaller print using prescribed magnifier or lenses?
  - Improved reading fluency, accuracy, or reading stamina?
  - Revised accommodations for print size or format?
- **Distance Visual Efficiency (Size and Distance)**
  - Spot and read from the board or classroom visuals using telescope?
  - Revised seating based on device use?

Access Academy

AMERICAN PRINTING HOUSE

Key LMA Components Change Post-LVE

- **Field of Vision is Narrowed** (high detail)
  - Reduced visual fields affect navigation, scanning and visual efficiency
  - Can the learner see more than 3-5 letters per fixation?
  - Does the learner have good tracking skills despite reduced visual fields?

Key LMA Components Change Post-LVE

- Visual Stamina
- Reading rate (wpm)
- Literacy Tools
  - Handwriting/signature

Access Academy

AMERICAN PRINTING HOUSE

Reading Metrics Post-Device Prescription

- **Key Metrics to Monitor**
  - **Rate**: Does the learner read faster using the device?
  - **Accuracy**: Are there fewer errors or misreads with the device?
  - **Fluency**: Is reading smoother and more expressive with fewer hesitations?
  - **Comprehension:** Can the learner answer questions correctly?
  - **Stamina:** How long can the learner sustain reading without fatigue or frustration?

Key LMA Components Change Post-LVE

- **Access to Educational Materials**
  - Improved access to grade-level text?
  - Using digital tools in conjunction with devices (camera apps, screen magnifiers, etc.)?
  - New recommendations for presentation of materials?
  - New assistive technology recommendations?

Other Considerations

- **Use of Prescribed Devices**
  - Can the learner use the prescribed devices effectively in real-world settings?
  - Is additional training or reinforcement needed?
  - Are there barriers to consistent device use?
    - Social, Cognitive, Environmental

Revisiting the Expanded Core Curriculum Assessment: Responding to Change

After Low Vision Devices are Prescribed and Initial Training is Completed

LVE Informs the Expanded Core Curriculum

- Social Interaction Skills
  - Increased confidence in visually demanding tasks?
- Self-Determination Skills
  - Is the learner advocating for their visual needs or device use?

- Sensory Efficiency
  - Use of optical devices
- Assistive Technology
- Independent Living Skills
- Recreation & Leisure
- Orientation and Mobility
- Career Skills
- Compensatory Skills
  - Access to print

Access Academy

AMERICAN PRINTING HOUSE

Update to Elevate: Bridging Data, Devices, and Decisions

- A Clinical LVE provides more than a prescription.
- Functional Vision and Learning Media Assessments must evolve alongside clinical findings.
- Accurate, updated data supports better decisions for learners.
- Bridge between clinical and educational assessments
  - ensures equity, access, and empowerment for learners with low vision

Access Academy

AMERICAN PRINTING HOUSE

References

- D'Andrea, F. M., & Farrenkopf, C. (2000). *Looking to learn: Promoting literacy for students with low vision*. American Printing House for the Blind.
- Hofstetter, H.W. (1991). Efficacy of low vision services for visually impaired children. *Journal of Visual Impairment & Blindness*, 85, 19-22.
- Koenig, A. J., & Holbrook, M. C. (1995). *Learning media assessment of students with visual impairments: A resource guide for teachers* (2nd ed.). Texas School for the Blind and Visually Impaired.

Access Academy

AMERICAN PRINTING HOUSE

References

- Lueck, A. H. (2004). *Functional vision: A practitioner's guide to evaluation and intervention*. American Printing House for the Blind.
- Sanford, L. D. (2008). *FVLMA: Functional vision and learning media assessment for students who are pre-academic or academic and visually impaired in grades K–12: Practitioner's guidebook*. American Printing House for the Blind.

Access Academy

AMERICAN PRINTING HOUSE

References

- Sewell, D., Cleveland, J., Grimmett, E., Lindsey-Ramirez, L., & McGrath, J. (2018). *Essential tools of the trade: A 'how to' guide for completing functional vision, learning media, and ECC evaluations* (2nd ed.). Texas School for the Blind and Visually Impaired.

Access Academy

AMERICAN PRINTING HOUSE