Matching Assistive Technology Features to **Low Vision Needs**

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Introduction

For students who have low vision, various interventions have the potential to maximize the use of functional vision which varies from student to student. Specifically, these strategies can maximize clarity, optimize the field of view, maximize color and contrast, optimize lighting, minimize glare, and enhance visual efficiency, visual comfort, and visual confidence. Consider the following general process to match students with appropriate low vision interventions within a functional setting:

- 1. Conduct a Functional Vision Assessment (FVA) with the student who has low vision to identify areas of visual need for task performance;
- 2. Identify features of low vision interventions that may help to meet these needs;
- 3. Have the student trial low vision interventions;
- 4. Gather data on student task performance with the low vision interventions; and
- 5. Compare the task performance before and after intervention prior to making intervention recommendations and/or referrals.

Instructions for Matching Assistive Technology Features to Low Vision Needs

This is a guide to assist with decision making when selecting Low Vision Assistive Technology strategies with students who have low vision. It consists of the following forms:

- 1. Student Profile
- 2. Task Performance
- 3. Features Impacting Performance
- 4. Recommendations

Student Profile

- 1. Complete the basic background information, including the student's name, date, and reason(s) why Low Vision Assistive Technology (LVAT) is being explored.
- 2. Task: Categorize which task the student would like to enhance visually in the following four areas.

Task Type	Distance	Duration	Examples
Extended near/intermediate	Within arm's reach	More than several minutes at a time	Reading a novel, completing a test online, painting a picture
Short-term near/intermediate	Within arm's reach	A minute or less	Reading a label, writing one's name
Extended distance	Beyond arm's reach	More than several minutes at a time	Watching a movie, watching a play
Short-term distance	Beyond arm's reach	A minute or less	Reading a street sign, previewing an environment

- **Description of Task**: Describe the requirements of the task and how the student currently performs the task using vision.
- Issues Surrounding Task: Discuss with the student the issues surrounding task performance. It is important to gather input from the student about their perceptions of the task and the associated visual challenges. Indicate possible reasons why the task should be enhanced visually.

3. Settings

- Task Setting(s): Describe the setting(s) in which the student will be expected to perform the task, along with a brief description of the lighting conditions.
- Trial Setting(s): Describe the setting(s) in which the student will trial LVAT while performing the tasks, if different from the Task Setting(s), and describe the lighting conditions.

4. Visual Needs

Discuss with your student which visual needs are implicated by the Current Strategy (described below) and indicate and/or describe the visual needs here.

5. LVAT Strategies to Explore

Brainstorm and indicate what you would like to trial. Tips:

- Before trying various LVAT Strategies, determine the date of the student's most recent clinical low vision examination (ideally within the past year), and confirm that the student is wearing the proper prescriptive lenses for performing the task.
- In many cases, but not all, handheld devices are best suited for short-term tasks as opposed to extended tasks.

Task Performance

This form is to be completed **each** time a new LVAT strategy for a near/intermediate task is tried.

1. Current Strategy

This refers to the Strategies the student is currently using to perform the task.

- Complete the "Using Current Strategy" column with the data that you have gathered while observing the student perform the task **before** introducing new LVAT Strategies. Refer to the "Visual Needs" column for suggestions on what to observe.
- Add plus signs (+) to indicate positive impact on task performance and minus signs (-) to indicate negative impact on task performance.
- If no data exist for a particular item, either gather this data if you feel it would be appropriate, or indicate N/A.
- To save time, it is recommended that you report all Current Strategy baseline data and save the file **first** before copying it. That way, you do not need to re-enter the Current Strategy data each time you work with a new LVAT Strategy.

2. LVAT Strategies

Once the file has been copied, you are ready to begin exploring LVAT Strategies.

- Indicate one primary LVAT Strategy at the top of each page.
- Complete the "Using LVAT Strategy" column with the data that you have gathered while observing the student perform the near/intermediate task while using the respective LVAT Strategy. Again, if no data exist for a particular item, either gather this data if you feel it would be appropriate, or indicate N/A.
- If you happen to incorporate multiple LVAT Strategies, indicate the secondary, tertiary, etc. strategies within this column.

When completed, you can quickly compare baseline task performance with the performance used with the LVAT Strategy. This will help you determine which features affected task performance.

Features Impacting Performance

Review your Task Performance sheets and determine which features and/or LVAT Strategies had the best impact on task performance. Most features listed are visual in nature, but you may indicate others. Features are grouped according to Visual Needs and categorized by the type of LVAT Strategy that you may have tried. There are four:

- Non-optical devices
- Prescribed optical devices
- Video magnifiers
- Tablets and Mobile devices

Complete only one of the respective Features Affecting Performance forms for each device category.

Recommendations

Review the Features Affecting Performance data and, provided that your data reveal that features were helpful to support an LVAT recommendation, recommend one or more LVAT Strategies, accessories and/or further exploration or training. Make sure that the LVAT Strategy you are recommending comes with the features that were helpful to the student.

Finally, provide a narrative Justification of your recommendations.

Student Profile

Stud	ent	Na	me:

Date:

Reason(s) for LVAT Feature Matching:

Task Type	Description of Task	Issues Surrounding Task Performance
 Extended near/int. Extended distance Short-term near/int. Short-term distance 		
	Description	Description

Setting Type	Description of Task Setting(s)	Description of Trial Setting(s)
 Home School Work Community Other 		

Visual Needs to be Addressed

Clarity & Field of View:
Visual Efficiency:
Lighting & Glare Control:
Color & Contrast:
Comfort & Confidence:

LVAT Strategies

Non-optical devices:				
Pres	cribed optical devices:			
Vide	eo magnifiers:			
_				
	Desktop video magnifiers:			
	Handheld video magnifiers:			
_				
	Transportable video magnifiers:			
	Digital magnifiers:			
Tabl	ets & mobile devices:			
Oth	er:			

Annotated Student Profile

Student Name: Nick O.

Date: 9/15/21

Reason(s) for LVAT Feature Matching Increased amount of note-taking in class

Task Type	Description of Task	Issues Surrounding Task Performance
 Extended near/int. Extended distance Short-term near/int. Short-term distance 	Nick would like to view the whiteboard from his desk and copy notes from the whiteboard onto his notebook paper without assistance.	Tasks are not fully supported by his distance from the board, distance from his paper, and insufficient task lighting at his desk.
Setting Type	Description	Description of Trial Setting(s)

Setting Type	Description of Task Setting(s)	Description of Trial Setting(s)
 □ Home ⊠ School □ Work □ Community □ Other 	Fifth-grade classroom with rows of desks, whiteboard mounted at the front of the room, overhead fluorescent lighting, and natural light.	Fifth-grade classroom with rows of desks, whiteboard mounted at the front of the room, overhead fluorescent lighting, and natural light.

Visual Needs to be Addressed

X	Clar	ity & Field of View:	
	Exp	olore relative size and relative distance magnification	
X	Visual Efficiency		
	Loc	calization, visual tracing, and visual tracking for distance tasks; shifting gaze:	
X	Ligh	ting & Glare Control:	
	Tas	k lighting at desk	
X	Colo	or & Contrast:	
	Ha	ndwriting with whiteboard markers against whiteboard and pencil handwriting against paper	
X	Com	nfort & Confidence:	
	Ind	ependence	
LV	AT S	Strategies	
X	Nor	-optical devices:	
	Wr	iting utensils, colored paper, task lamps, wearable filters	
X	Pres	cribed optical devices:	
	Ha	ndheld telescope, stand magnifier	
X	⊠ Video magnifiers:		
		Desktop video magnifiers:	
		Handheld video magnifiers:	
	X	Transportable video magnifiers:	
		Distance and near camera devices (VisioBook, MATT Connect, Magnilink, Reveal 16i)	

Digital magnifiers:

Tablets & mobile devices:

iPad and external camera

□ Other:

Task Performance

LVAT Strategy:

Visual Needs	Using Current Strategy	Using LVAT Strategy
Clarity & Field of View Rx Focal distance Working distance Font size Enlargement Ratio Other		
Visual Efficiency Alignment with target Localization of a stationary target Tracing lines Tracking across lines Tracking moving objects Scanning Eccentric viewing Shifting gaze Body positioning Other		
Lighting & Glare Control Location of light Source of glare Body positioning Eye shielding, squinting Other		

Task Performance (continued)

Visual Needs	Using Current Strategy	Using LVAT Strategy
Color & Contrast Foreground color Background color Page quality Line/stroke quality Other		
Comfort & Confidence Posture/ergonomics Orientation to material Manipulation of device Accuracy: WPM WCPM Comprehension Writing: Placement on line Letter/word spacing/sizing Affect Behaviors Independence Other		

Comments:

+ = positively enhanced performance

- = negatively influenced performance

Annotated Task Performance

LVAT Strategy: VisioBook

Visual Needs	Using Current Strategy	Using LVAT Strategy
Clarity & Field of View Rx Focal distance Working distance Font size Enlargement Ratio Other	Rx -1.00 – 0.50 x 180 OU Board: distance=within 15 ft, teacher's handwriting ~ 4" tall Paper: distance=6", handwriting ~ 1" tall	Rx -1.00 – 0.50 x 180 OU + Board: distance=15-30 ft from the board and about 16" from monitor; teacher's handwriting ~ 4" tall actual size, projected size ~ 1" tall on monitor + Paper: distance=16" from monitor; handwriting ~ 0.50" tall actual size on paper, 1" projected size on monitor + Appreciated magnified stroke of pencil markings.
Visual Efficiency Alignment with target Localization of a stationary target Tracing lines Tracking across lines Tracking moving objects Scanning Eccentric viewing Shifting gaze Body positioning Other	 + From his desk, Nick visually localized teacher, tracked teacher's movements and was visually aware of where teacher is writing on the board. - Demonstrated difficulty shifting gaze. 	From his desk, Nick visually localized teacher, tracked teacher's movements and was visually aware of where teacher is writing on the board. + Shifted gaze from whiteboard to paper and back with quicker speed and less body movement. - Demonstrated difficulty localizing his hand and pencil tip beneath the camera for writing.
Lighting & Glare Control Location of light Source of glare Body positioning Eye shielding, squinting Other	 + Overhead fluorescents on ceiling, and natural light coming in from a window at the back of the classroom (located behind Nick's desk). + No glare reported. - When getting within 6" of his paper, he created shadows that resulted in task lighting issues. 	 + Appreciated internal light source from VisioBook and no glare reported but occasionally changed the monitor brightness as needed. + Preferred having the light on.

Annotated Task Performance (continued)

Visual Needs	Using Current Strategy	Using LVAT Strategy
Color & Contrast Foreground color Background color Page quality Line/stroke quality Other	 + Nick was more aware of black ink on the whiteboard as opposed to blue and green. - Nick squinted to view his handwrit- ing in pencil. 	 + Nick visually identified all colors of dry erase marker (black, blue and green). + Appreciated contrast enhancement for viewing pencil writing on paper.
Comfort & Confidence Posture/ergonomics Orientation to material Manipulation of device Accuracy: WPM WCPM Comprehension Writing: Placement on line Letter/word spacing/sizing Affect Behaviors Independence Other	 Nick craned his neck and hunched forward. Did not prefer moving his desk right in front of the board. Required assistance from a classroom aide to read to him what is being written on the board. 	 + Nick was comfortable manipulating the controls and camera of the VisioBook. + Felt that it wasn't too heavy of a device to carry from one class to another. + Maintained an upright posture and was more comfortable shifting gaze. + He asked how long he could keep the device.

Comments:

Electrical outlets are not located near his desk; prefers VisioBook over optical devices

+ = positively enhanced performance

- = negatively influenced performance

Comfort & Confidence	Audio features: Tactile features: Plexiglas: Other:
Color & Contrast	Sun lens 9::
Lighting & Glare Control	 Task lighting: Ambient lighting: Ambient lighting: Lighting fixture: Dutdoor sun lens: Outdoor sun lens: Outdoor sun lens: Photochromic Photochromic Indoor sun lens: Color Frame Polarized Photochromic Indoor sun lens: Outdoor sun lens: Slinds/curtains Other:
Visual Efficiency	 Slant board Clipboard Occluder Typoscope Underline Other:
Clarity & Field of View	Typoscope: Underline: Writing utensil: Writing utensil: Eline/stroke width: Earge print font size: Other:

Comments:

Non-Optical Devices: Features Impacting Performance (+/-)

Clarity & Clarity & Field of View Corrective lenses/Rx Corrective lenses/Rx Corrective lenses/Rx Corrective lenses/Rx Corrective lenses/Corrective lenses/Co	Visual Efficiency Spectacle-mounted Center-mount Superior-mount Carrier lens Clip-on Tilting lens Other:	Lighting & Glare Control Built-in LED light LED filter cap color Other:	Color & Contrast R tint R tint 0:00r: 1:00r: AR coating 0ther:	Comfort & Confidence Manipulation of device:
 Near/Intermediate optical device: Power (D): Right eye/OD Left eye/OS Distance optical device: Magnification (x): Eield of view: Right eye/OD <				Focus Mechanism:
Comments:				

Clarity & Field of View	Visual Efficiency	Lighting & Glare Control	Color & Contrast	Comfort & Confidence
 Enlargement ratio Projected (cm/in): Actual (cm/in): Morking distance (cm/in) Type of magnification T	 X-Y table X-Y table Lock Adjustable tension Placeholders Margin stops Mini X-Y table Mini X-Y table Mini X-Y table Mini X-Y table Platen table Underline Other: 	 Built-in light Brightness control Brightness control Adjustable Adjustable Polarity Polarity Reverse Shadow masking Other: 	Foreground color: Background color: Full color Grayscale Polarity Positive Reverse Other:	 Monitor Monitor Tilting Repositionable arm Repositionable arm Location of controls On monitor On X-Y/Platen table On camera On camera I ablet controls On camera I ablet controls D ncability I ablet controls I ablet connectivity I Wi-Fi connectivity I other:
Comments:				

Video Magnifiers: Features Impacting Performance (+/-)

Comfort & Confidence	tivity tivity	
Comf	 Operating system Operating system IOS: Android: Mindows: Mindows: Built-in Camera Built-in Detached Portability Portability Portability Rechargeable battery Text-to-speech: Neight: Text-to-speech: USB connectivity USB connectivity USB connectivity Other: Other: 	
Color & Contrast	 □ Text quality □ Bold text □ Darken colors □ Darken colors □ Invert colors □ Smart Invert □ Smart Invert □ Smart Invert □ Reduce transparency □ Reduce transparency □ Color filters □ Vhite/blue □ Vellow/black □ Green/red □ Blue/yellow □ Intensity (%): □ Other: 	
Lighting & Glare Control	 Flashlight (on/off): Brightness control (%): Polarity: Polarity: Display Accommodations: Display Accommodations: Com filter Auto-Brightness Coom filter Coom filter Coom filter Coom filter Other: Other: 	
Visual Efficiency	 Zoom Follow focus Smart focus Smart typing Show controller Idle visibility (%) Idle visibility (%) Zoom region Idle visibility (%) Level: Minimum Zoom Level: Stand Other: 	
Clarity & Field of View	 Morking distance (cm/in): Zoom/magnification: Zoom/magnification: Zoom/magnification: Text quality Text quality Text quality Text quality Text size (in): Text quality Text size (in): Text quality Text quality<th>Commonte.</th>	Commonte.

Tablets and Mobile Devices: Features Impacting Performance (+/-)

Recommendations

□ Non-Optical Devices:

□ Prescribed Optical Devices:

□ Video Magnifier:

□ Tablets and Mobile Devices:

□ Accessories:

□ Next Steps/Future Planning:

Justification:

□ Additional Comments:

Commonwealth of Pennsylvania

Josh Shapiro, Governor



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