Integrated intelligent LEARNing environment for Reading and Writing
D3.4 – Test Bed Specifications Report

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Author(s)	V. Zakopoulou, M. Mastropavlou
Contributor(s)	J. Rack
Reviewer(s)	Barry Beggs, UCB, Sibiu.

Abstract	
	The content of this deliverable concerns the specifications for the test-beds that will be used for evaluation of the ILearnRW software. The main aim is to define and clarify the criteria, from a technical and pedagogical point of view, that should be taken into consideration while evaluating software intended for children with dyslexia, as following.The two main objectives of the software testing process are to demonstrate that it satisfies all the identified user's requirements and to demonstrate that errors leading to unacceptable failure conditions are removed.

Once implemented, the effectiveness of the software with respect to improving the learners' skills will be evaluated using measurements and recordings of progress internal to the game and the learning program elements, backed up by standardised testing. However, we are cautious about committing to a large-scale evaluation of progress until we have fulfilled the requirements of the users and developers in terms of functionality. Our approach is to include a systematic evaluation of two samples, in the UK and Greek as a supplement to the ongoing evaluation provided during the development phase. |

Keywords	Software Evaluation; User Requirements; Reading Improvement.

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Project Officer: Krister Olson

Address:	L-2920 Luxembourg, Luxembourg
Phone:	+35 2430 134 332
E-mail:	krister.olson@ec.europa.eu

Project Co-ordinator: Noel Duffy

Address:	Dolphin Computer Access Ltd. Technology House, Blackpole Estate West, Worcester, UK. WR3 8TJ
Phone:	+01 905 754 577
Fax:	+01 905 754 559
E-mail:	noel.duffy@yourdolphin.com

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TEST BED SPECIFICATION – ILEARNRW EVALUATION PROCEDURE

1. Prototype Evaluation

1.1. Introduction

The content of this deliverable concerns the specifications for the test-beds that will be used for evaluation of the ILearnRW software. The main aim is to define and clarify the criteria, from a technical and pedagogical point of view, that should be taken into consideration while evaluating software intended for children with dyslexia, as following:

In D3.1 we established the following requirements for the system.

- Should be suitable for sustained reading and approach text in small chunks. The reader should present document structure if present, and allow the learner to create their own
- Should offer both immediate, medium and long-term rewards
- Should support individual preferences about times for working (10 minutes every day or 2 hours at the weekend for example)
- Navigation and design must be sensitive to memory load. For example, instructions should be chunked and difficult steps not presented in a rapid sequence or on a single page
- Should accommodates memory difficulties generally (see structure navigation above)
- Should accommodate speed of processing difficulties (see instructions above)
- Should accommodate frequent difficulties dyslexic readers have with organization and coordination. For instance, make it easy to plan reading, provide reminders of achievements and next steps. Make it easy to move data from one device to another (in case of a loss of device)

Our application must also support the development of meta-cognitive skills, including:

- Learning to modify text to suit a learner's preferences
- Developing skills to find modes of reading suitable to a learner's preferences.
- Developing skills to identify elements of text that are causing decoding difficulties
- Developing skills for transferring rules for decoding into spelling
- Developing skills to discover underlying rules to help with decoding
- Developing skills of self-observation

Considering the application of the system in educational contexts, we add to this list that the system must be able to:

- Meet the user's needs in terms of developing skills in reading and writing processes including the comprehension and production of phonology, memory, grammar, syntax, vocabulary and comprehension
- Be suitable for individual and group work
- Use short tests for self-assessment
- Be based on specific theoretical learning and teaching strategies
- Have an innovative character aiming to a multidisciplinary learning environment
- Be adapted to the user's age and stage of development

- Be designed according to appropriately adapted plans for considering changing needs of user
- Be attractive and interactive: including games, puzzles, picture stories, etc.

The use of the software will be evaluated in two different educational settings, in two countries (i.e. Greece and the United Kingdom). This deliverable presents the details of this research design including the organisation of the formative evaluation, the collection and analysis of data, and the expected outcomes, referring to the functionality, the context, and the use cases, the technical features, the accessibility and the educational potential of the ILearnRW system.

As detailed in the Use Cases in D3.1, ILearnRW will promote learning and the development of literacy skills. It will be designed to be used both at school, at home and in the context of any reading task, i.e., it will be designed to be responsive to any situation. The application will be accessed through a portable tablet computer. Subject to the finalisation of the design, we are assuming here that the learner (children, parents or teachers) will have the option to choose between two modes: the *reading* and *learning* mode and the *playing* mode.

The two main objectives of the software testing process are to demonstrate that it satisfies all the identified user's requirements and to demonstrate that errors leading to unacceptable failure conditions are removed.

Once implemented, the effectiveness of the software with respect to improving the learners' skills will be evaluated using measurements and recordings of progress internal to the game and the learning program elements, backed up by standardised testing. However, we are cautious about committing to a large-scale evaluation of progress until we have fulfilled the requirements of the users and developers in terms of functionality. Our approach is to include a systematic evaluation of two samples, in the UK and Greek as a supplement to the ongoing evaluation provided during the development phase.

1.2. Aims and research questions (RQs): Evaluate software performance, technically and scientifically: Evaluation of prototype.

The test-bed infrastructure will provide a set of tools and methodologies to enable prospective users, such as component owners, target groups and experts to generate test-beds results, not only for the final software evaluation, but also serve as the means to reduce probable testing flaws (technical or constructional), while maintaining efficiency and contribution to the learning disorders reduction.

1.2.1. Software relevance:

Is the software design and content (activities and games) appealing to the specific users and appropriate for their needs?

The ILearn RW software, targeting to the development of a supportive learning platform, adapted to the specific disorders of the users, will include the following models:

- *Learner Model:* The model will hold details of the specific reading and writing difficulties a child may experience including, but not limited to, difficulties in recognising or elaborating on specific letters, difficulties in reading words in sequence and difficulties in writing letters.
- *Serious Games:* Through serious games, the ILearnRW software will be motivating, flexible and fun. In addition to the main game, it is likely that there will be a series of mini-games/activities, possibly integrated into the game and/or the reader.
- *Reader Facility:* an e-reading technology designed specifically to assist dyslexic children with reading particular texts as well as improving their reading skills more generally.
- *Content Classification System:* This system will assess the level of difficulty associated with a given text based on a child's specific difficulties.
- *Collaborative play:* the user may be able to play the game locally, or as part of a group effort. *Externalising the Learner Model to the Learner:*
- Our system will collect data about the child's progress and the strategies used.
- *Customisation and flexibility:* the software could provide more flexibility in terms of situating children's learning within purposeful activities.
- *Externalising the Learner Model to the Tutor:* Using information stored in the learner model, we could summarise how much reading the child has done, in what way, and demonstrate the particular weaknesses and strengths identified. These indicators could be accessed through a website by the tutor.
- *Collaboration and peer support:* the application could promote social reading between peers through challenges proposed within the game, joint reading tasks set up through the reader, or even by setting up a reading task with a younger non-player game character.
- *Assessing relevance:* Turning our attention to the content classification, sophisticated metrics could be used. Readability algorithms could classify texts by grade level.

1.2.2. Technical performance:

Does the software present any technical flaws?

The estimated high degree of the technical performance of the ILearn system, is composed on the following features that have been designed appropriately to the target users' profile.

Specifically, the features that will be adopted, are the following:
- Options of full speech support on content, menus and help features.
- Clear, spoken instructions that can be repeated or paused.
- Opportunities to review and repeat.
- Options to alter format — background, font, colour, font size
- Clear uncluttered screens
- Written text in a clear readable format and font
- Clear images that can be easily identified
- Easy to navigate with clear icons for accessing tools, menus or onscreen help
- Pupil tracking where appropriate — time taken, tasks attempted or completed
- Pupil / teacher options to meet individual learning preferences
- Options for differentiated levels or activities
- Full speech support for word processed text, spellcheckers and word banks
- Spellcheckers with speech support and displayed definitions, also spoken

- Text highlighted when spoken or text spoken when selected
- Additional access options if required (e.g. switch control).

1.2.3. Software usability:

Is the software easily handled by students?
Does the software address the key symptoms of dyslexia initially targeted?

This software usability will be the result of many factors: an appropriate speech supported software, selected hardware, or programs/methodologies specified to support and improve phonological, reading and writing skills, and comprehension.

Some dyslexic learners also have co-ordination, sequencing and organisational difficulties. This may affect their handwriting, cause learners to produce less work or take a lot longer than expected. A proper keyboard for children with dyslexia will be used; once they have mastered the keyboard, a portable hand writing device on the tablet can often facilitate them, allowing them to concentrate on content rather than process.

ILearn RW is an integrated intelligent learning software environment which can provide the necessary risk taking, patient, multi sensory approach that many children with dyslexia need. This can result in increased confidence and self-esteem, enabling users to:

- see and hear written text on screen
- repeat and review information as and when they need to
- try out actions first and make an informed choice
- practise skills that meet their needs in both pace and content
- overcome barriers such as slow typing or writing speed and spelling
- record and edit ideas easily using ordinary word processing, word banks
- demonstrate their knowledge and ability
- work more independently.

Is the mapping of screening results (user profile) onto activities selected accurate?

Dyslexic profiles:
According to the above types of difficulties, specific dyslexic profiles could be arisen:
- Profile of Reading difficulties
- Profile of Writing difficulties
- Profile of Reading +Writing difficulties

For each one of the above profiles, a group of the specified activities could be applied, respectively

In order the child's profile of difficulties to be constructed:
- We ask the child's parent/teacher/therapist to complete a multiple-choice questionnaire according to their estimation about the child's difficulties
- We ask the child to read a text loudly, write it and answer specific questions, recording the child's difficulties

The collection and the analysis of the results will create the individual profile with specific difficulties, which should be adapted to one of the above outlined profiles.

In accordance with that profile, we will be able to choose and apply the appropriate material, approaches and techniques in any kind of combination and application, aiming to achieve short-term as well as long-term targets.

1.2.4. Internal consistency reliability - Variables:

Several statistical approaches will be applied aiming to assess the correctness of the internal consistency reliability of the tool (i.e. kappa coefficient, Se & Sp); the main object is to determine the degree of perspicuity of the software instructions and the ability of the correct definition of the user's profile. Test-retests (the software will be reconducted within two weeks), parallel forms (parallel administration of a second instrument) will be applied.

As a result of the above theoretical and interpretive approach, the independent and dependent variables are defined as following:

- *Independent variables*: teacher/parent presence, dyslexia, gender, additional (or not) support (types of support apart from the attendance at the software program), speech therapy and intervention history.
- *Dependent variables*: Technical performance: incidence and/or frequency of fatal errors; Usability: software use, handling of commands, following instructions; the performance of the three groups in particular sectors and sections of the software, during the length of the ILearn RW implementation.

1.3. Participants:

All the parts of the ILearnRW system, along with the clear and specified instructions for users, should provide firstly, a way to reduce the testing effort in a large sample of children with dyslexia and/or the relative environment involvement; secondly, to ensure that the validation and verification processes are clearly assigned.

Each of the national test beds will involve a sufficient number of children diagnosed with dyslexia, 9-11 years old; 20 children will use with teacher guidance; 20 with parent guidance; 20 with system guidance; all the children should be Greek – English monolingual, in principle with an equal ratio of boys and girls.

An important specification is that it will not be possible to ensure that all learners have a comparable diagnosis. Indeed, it will not be necessary for all the learners taking part in the evaluation to have a formal diagnosis. However, given that specific criteria have been outlined addressing the needs of children with reading and writing disorders, 50% -100% of the learners must meet locally those criteria for dyslexia.

Consequently, the learners involved will have the following literacy profile: Their score on a common national test of their ability to read and write a written text (or on an equivalent means of assessment) belongs to the lower quartile. In order to evaluate the prototype software with a proper representation of the target audience, the teachers involved will be asked to choose learners where at least 50% has the lowest test scores. Since the evaluation is aiming at testing the prototype software – not the learners – the national evaluators will be collecting anonymous data, i.e. data identifying the learners with a codeword.

1.4. Materials & Procedure:

The ILearnRW prototype will be used by 60 children with dyslexia. For each child the system will create a profile in which the pupil's performances and preferences will be held. Initially, when a pupil accesses the ILearnRW system for the first time, his/her profile can be set using several ways as:

- Automatically a predetermine profile will be set for every pupil.
- A profile can manually build (by the teacher or the parent) according to the prior knowledge of the pupil
- Automatically built a unique profile according to the pupil's performance when he/she is asked to reading a predefined initial text using the ILearnRW prototype.
- After the initial profile will be set, the system will present the educational content in a manner, appropriate to the pupil's profile.

The system will provide on-line profile adaptation based on the pupil's reading performance as well as pupil's state (active/passive reading, engaged or not, hyperactive or not, positive/negative attitude etc.) which will be captured by the multimodal data facilities. In addition, the system will have the choice for manually change of the pupil's profile either from his/her teacher or from his/her parent.

According to the learner profile, changes in the text formatting (font size, type and colour, highlighting style and speed) will happen in order to improve dyslexic pupil's skills finding alternative methods of reading. In this way, a novel personalised learning environment will be provided, which will take into account the individual requirements of each user (user profiles, user models and all the personalisation metadata), which will be contained in a personalisation ontology.

1.4.1. "Intervention" environments

Several possible "intervention" environments like the following three learning scenarios, concerning the educational use of the prototype software will be formulated as has been started in D3.1as follows:

1.4.1.1. Use Case 1: Schoolwork/Homework

Year 6 have been reading a book within class, using the ILearnRW reader. At the end of the lesson, the class is set the homework of reading a chapter of the class text in preparation for their next literacy lesson the next week. For the children within the class who have reading difficulties this homework is set using the ILearnRW tool.

1. Teacher (or child) uploads the chapter to be read for homework to the ILearn tool and inputs a description of the homework task and the due date.
2. At home the child begins their homework by opening the text within the tool
3. The system tailors the presentation of the text based on the child's user model
4. The child begins reading the text and gets stuck on a particular word/phrase
5. The child selects the word/phrase they are having difficulties with

6. The system provides additional help for that word/phrase
7. The system records the word/phrases the child had difficulty with in the user model
8. The child stops reading the text
9. The child (or their parent?) indicates if they have completed reading the entire text or will come back to it later
10. If the child has only part completed the text:
    a. The system saves the position in the text the child has reached
    b. The child reopens the text at a later time
    c. The system displays the text from the saved position
    d. Go to step 3

    If the child has completed reading the entire text:
    The system provides positive feedback to the child
    Go to step 12
11. The parent/teacher views a report of the child's progress with the text
12. The system generates the report based on the difficulties the child indicated they had with specific words/phrases during their reading of the text and the time spent reading in combination with the difficulties additionally identified by the system itself.

1.4.1.2. Use Case 2: Reading for Pleasure

A child is at home and wants to read a text that is fun and different to the texts he/she has been studying in school.

1. The child opens the iLearn tool and navigates to the home screen screen
2. The system displays two options 'continue reading previous text or 'choose new text.
3. If the child chooses chooses 'continue reading previous text:
    a. The system displays a list of images representing texts the child has previously begun reading
    b. The child scrolls through the text images until they see the text they wish to continue reading and clicks on the chosen text image
    c. Go to step 6
4. The system displays the images representing texts targeted at the child's age group, reading level and interests based on information from the user model
5. The child scrolls through the text images until they see one that looks interesting and the clicks on the chosen text image
6. The system tailors the presentation of the chosen text based on the child's user model
7. The child begins reading the text and gets stuck on a particular word/phrase
8. The child selects the word/phrase they are having difficulties with
9. The system provides additional help for that word/phrase
10. The system records the word/phrases the child had difficulty with in the user model
11. The child stops reading the text and closes it
12. If the child has both looked at every page of the text and is currently on the last page of the text:
13. The system asks the child if they have completed reading the text
14. If the child indicates that they have finished:
    a. The system records the text as completed
    b. The system provides positive feedback to the child
    c. Go to Step 14

    If the child indicates that they have not finished:

The system saves the position in the text that the child has reached (i.e. the last page)
Go to Step 14

15. The system saves the position in the text that the child has reached
16. The system presents the child with a choice of activities/mini-games tailored to the preferences within the user model and incorporating text from the pages the child has just been reading.
17. The child selects the activity/mini-game they wish to play
18. The child plays the activity/mini-game
19. The system records the errors/successes of the child within the user model
20. The child finishes playing the activity/mini-game
21. The system provides positive feedback to the child
22. The parent/teacher views a report of the child's progress with their reading
23. The system generates the report based on the difficulties the child indicated they had with specific words/phrases during their reading of the text, the time spent reading and the difficulties/successes the child experienced during the activities/mini-games.

We note that both use cases are equally applicable to speakers of Greek and English. Both use cases are inclusive to the three personas we presented earlier.

In addition, we envisage developing further use cases:

1. The ILearnRW prototype will be installed at the integration classes where 20 children will use it with their teachers' guidance.

   Each SEN integration class has one or two PCs (with equipment such as camera, microphone, and loudspeakers) for educational purposes. In these PCs, the ILearnRW prototype software will be installed in order to be accessed by these pupils with their teacher's directions.

2. 20 children will also use the ILearnRW prototype at home having their parents' guidance.

3. 20 children, independently of the place where the prototype will be installed, they will use the ILearnRW prototype following the software instructions without any additional help. After the installation of the prototype, an illustration of it will be presented to the users by the ILearnRW Greek partners. Additionally, an analytical manual for installation and usage of ILearnRW software will come along with the software.

1.4.2. Questionnaires that will include evaluation criteria addressing the above variables will be distributed to teachers/parents (See appendix).

2. Software Effectiveness

2.1. Aims and research questions (RQs): Evaluate software effectiveness on students' performance.

Three main research questions have been formulated:
- Does the software affect student reading performance?
- Does the software affect student spelling performance?
- Does the software affect students' motivation?

Answering to the above questions, we'll try to evaluate: i) the effectiveness of the content of the ILearnRW software: texts, games, mini-games an, ii) the contribution of the software in the minimization of the difficulties, the acquisition of specific skills, the automation/generalization of learning achievements.

Two are the main criteria according to which the estimation of the above parameters will be developed: i) the quality and, ii) the quantity.

- The criterion of the "quality" refers to the degree in which the texts, the games and the material could help the child to acquire: fluency, speed and accuracy in the skills of: phonological awareness, reading ability, writing (spelling) ability and comprehension of the written speech.
- The term of the "quantity" reflects: i) the number and the range of the symptoms that are aimed to be minimized: omissions of letters/syllables, confusions, replacements, substitutions, spelling errors, stress errors, grammatical errors and, ii) the occurrence of the symptoms regarding: the letter, the syllable, the word, the sentence/paragraph, the text.

2.1.1. Variables:

In order to confirm the degree of the validity and reliability of the software material, we will attempt to convert the main theoretical parameters/suppositions of the ILearnRW system, to measurable statistical data variables. Consequently, in the frame of analysis we will exam the importance of the following parameters:

- The role and the dynamic of the types of dyslexia and the range of the dyslexic symptoms; the whole individual profile
- The role of the educational system the learning procedure and
- The availability, adequacy and property of the individual sections of the intervention program, which were processed and evaluated during its application, according to: the degree of difficulty; the length; the complexity of the rules; the content gradation; the text view classification
- the role of the children's performance in specific thematic areas and sections of the intervention program

As a result of the above theoretical and interpretive approach, the independent and dependent variables are defined as following:

Independent variables: software use, the profile of dyslexia, the gender, the age, and the additional or not support (history/types of support apart from the attendance at the specific program).

Dependent variables: the degree of performance/progress in sections of reading and writing/spelling accuracy and fluency, and the children motivation

Aiming to evaluate the above variables, appropriate statistical procedures will be specified:

i) analysis of the children's performance in the initial diagnostic measurements

ii) analysis of the recording and tracing of the children's performance during the software application, lasting an 9 months' time of real sessions, per three months, per:

i. individual material: texts, mini-games, serious games

ii. individual sector: reading, writing/spelling, comprehension

iii. degree of accuracy and fluency

iv. level of: letter, word, sentence, paragraph, text.

2.2. Participants

60 children ranging from 9-11 years of age with a variety of reading and writing difficulties will constitute the entire study sample. The primary criteria for the selection of the sample will be as homogenous a clinical picture as possible depending on: i. the degree and the kind of reading, writing and comprehension difficulties; ii. The individual developmental history; iii. the degree of knowledge of new technologies; iv. The monolingual profile (Greek monolingual- English monolingual); v. the probability and the length of earlier of alternative intervention procedures.

Prior to the collection of data, teachers/parents/experts will be educated in the use of the software. This education is aimed at ensuring the quality of the collection of evaluation data, some of which will be done by the teachers using the software with their pupils and answering questions. The teacher education will cover the systematisation of procedures of the data collection.

2.3. Materials & Procedure

Initially, when a child accesses the ILearnRW system for the first time, his/her profile can be set using several ways as:

- Automatically a predetermine profile will be set for every child.
- A profile can manually build (by the teacher or the parent) according to the prior knowledge of the child
- Automatically built a unique profile according to the child's performance.

After the initial profile will be set, the system will present the educational content in a manner appropriate to the child's profile.

Based on the child's profile, changes in the text formatting (font size, type and colour, highlighting style and speed) will happen in order to improve child's skills finding alternative methods of reading and spelling. In this way, a novel personalised learning environment will be provided, which will take into account the learning strategies, the individual requirements of each child (user profiles, user models and all the personalisation metadata), which will be contained in a personal portfolio.

This portfolio will be portable (e.g. can be stored at a child's flash memory stick or at a central server) giving the freedom of movement to the child and providing an accommodative environment.

In this accommodative environment, the child will have the opportunity to improve his/her performance and achieve a positive development of his/her learning process in general.

2.3.1. Children's evaluation

The evaluation of the problems of the children will be developed in three phases: i. initial evaluation: children will be assessed on specific criteria (reading and writing difficulties) quantified by scores in questionnaires for parents and/or national measurements (i.e. εΜαΔυς test), prior to exposure to the content of the software; ii. Inner evaluation will be repeated after the completion of separate activities sub-units (three re-evaluation procedure; one per three months); iii. Final evaluation: questionnaires for parents and national measurements will be applied; A comparison between the results of the initial evaluation and the final one will determine the effect of software on students' performance.
Specifically,

All participants will be evaluated 4 times during the software application. Initially, the starting assessment will be focused on children experience with ICT and the diagnosis of their difficulties. A second assessment will be held after three months and it will be focused on the possibilities of the software use, the problems and needs that children would be face, and feedback about their progress in a first grade of targeted tasks in particular corpus of activities; after three months (six months of the ILearnRW usage) a third assessment of the children's performance will he held: at this stage of the evaluation the children's fluency, accuracy and speed in combinations tasks with high degree of difficulty, will be tested. Finally, at the end of the software application, the initial questionnaires and tests will be applied again aiming to compare and correlate any possible improvements remarked in the child's performance as a result by the software effectiveness and, moreover, to estimate the general contribution of the ILearnRW system in the learning process.

Questionnaires evaluating the overall software performance and effectiveness will be distributed to the children and their teachers/parents.

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4. Appendix:

ANNEX 1: SOFTWARE USABILITY QUESTIONNAIRE **...**

Questionnaire

Title of software package / program:	
Criterion	
Is it easy to start the program?	Yes/No
Is the user interface easy to understand? (For example, is the screen layout clear and easy to interpret?)	Yes/No
Is it easy to navigate through the program?	Yes/No
Are icons that are used to assist navigation (e.g. back to the homepage, exit) clear and intelligible?	Yes/No
Is it always clear to you which point you have reached in the program?	Yes/No
Does the scoring system encourage you?	Yes/No
Are you offered useful feedback if you get something wrong?	Yes/No
If the system gets something right purely by chance, can you seek an explanation in order to find out why the answer is right?	Yes/No
Can you seek help, e.g. on grammar, vocabulary, pronunciation, cultural content?	Yes/No
Can you easily quit something that is beyond your ability?	Yes/No
Are the grammar and vocabulary used in the program accurate?	Yes/No
The program includes pictures; are they (a) relevant, (b) an aid to understanding?	Yes/No
The program includes sound recordings; are they of an adequate quality?	Yes/No
The program includes sound recordings; are they (a) relevant, (b) an aid to understanding?	Yes/No
The program includes sound recordings; is there a good mix of male and female voices and regional variations?	Yes/No
Is the program relevant to your national / regional / departmental programme of study?	Yes/No

ПНГН
www.ict4lt.org/en/evalform.doc   ■

ANNEX 2: SOFTWARE EVALUATION FORM

Documentation/Contents

Title			Publisher Name		Publisher Web Address	
Evaluated by						
Stated Target Population			Subject Area			
Cost	Individual Unit		$	Lab Pack (per ___ users	$	
Operating System Supported	Mark all that apply: **Windows:** 95 98 2000 NT XP	Minimum Memory Required			Storage Space Required	
	Macintosh: OS 8.x, OS 9.x, OS X **Other:** Unix/Linux	Minimum Processor Required			Other Required	

Product Resources	Required (R) or Optional (O) Hardware	Publisher Policies	Documentation Content	In software	Avail On-line	Accomp Matl
Content List Installation Guide Printed Manual Manual on CD On-Line Manual (e.g., PDF, HTML) Other content (worksheets, posters, books, etc) – explain Other online resources - explain	___ Printer ___ Color printer ___ Disk drive ___ CD drive ___ DVD drive ___ Keyboard ___ Mouse ___ Touch Window ___ Single switch interface ___ Multiple switch interface ___	Preview/Demo Policy (explain): Warranty/Guarantee Policy (explain)	Computer operation/use instructions Specific educational goals Use with specific special populations Curriculum inclusion and scope Sample program screens as examples Removable menu or	☐ ☐ ☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐ ☐ ☐

	___	Not Available	direction cards Specially written student directions			

My Rating of Documentation /Contents: (Mark one)	*poor*	1	1.5	2	2.5	3	3.5	4	4.5	5	*excellent*

Notes (Explanation of thoughts and observations related to above information)	Rationale (Reflective summary of why rating was assigned):

Learning Considerations

Category	Presentation Mode	Response to Student Answers	Feedback Mode	Student Progress Monitoring
Tutorial Drill and Practice Simulation Demonstration/ Information or Reference	Visual (Text) Visual (Images) Visual (Animation) Visual (Video) Auditory (Narrative) Auditory (Instructions)	Positive feedback Negative feedback _____ Correct response given after _____attempts Correct response never	Visual (text) Visual (images) Auditory (text) Auditory (sound) Auditory (music)	On-going student progress feedback AutoSave of student progress Can save individual settings for ___ students Can save data for ___ students Student performance report on screen

Productivity Instructional Game and Problem Solving Multimedia Literature Test Other: _____	Auditory (Music) Other	given Lesson/concept retaught after _____ incorrect answers Correct concepts dependent on spelling		Student performance report print-out None

Universal Design Considerations: Demands on User

To successfully use this program a user must:				
Visual Requirements	Cognitive Requirements	Reading Level Requirements	Auditory Requirements	Response/Input Requirements
Have a color monitor Read upper and lower case Differentiate colors Track mouse/pointer Differentiate objects	Spell responses correctly Use capital letters and/or punctuation correctly Remember menu commands Remember sequence of directions Remember keyboard commands Remember login/password Other _____	Read directions Read menus Read documentation Read information at indicated grade level Have adult help because of the reading level None	Remember auditory sequential directions Remember auditory directions Respond to auditory only prompts Understand synthesized speech None	Respond within time limit Use single keystrokes Use multiple keystrokes Use numerals Use symbol keys Use arrow keys Use function keys Use a mouse Use other pointing device Speak
Reflective Summary (Summarize the demands on the user responding to each of King's (1999) categories of demand *[See Appendix B]*: Physical Demands: Linguistic Demands: Cognitive Demands: 				

Universal Design Considerations: Adaptability

As a teacher, you can:				
Content Modifications	Criteria Modifications	Rate/Time Modifications	Sound Modifications	Allows for Adaptive Device Modifications
Add to content Change content Choose level of kinds of items Permit access to different components or content depending on user abilities Cannot change content Change presentation language	Adjust number of items Adjust number correct before proceeding Adjust number of misses allowed Cannot adjust criteria Other:	Adjust time allowed for response Change cursor movement speed Change speed of presentation Cannot modify rate/time	Add synthesized speech support Add digitized speech support Cannot modify sound	Touch Window Single Switch Multiple Switch Voice Recognition Adapt cursor/pointer size Intellikeys None of the above
Reflective Summary (Summarize the extent to which the software is adaptable to diverse learners):				

My Rating of Overall Universal Design Consideration (Demands on User <u>and</u> Adaptability Sections Together): (Mark one)

poor 1 1.5 2 2.5 3 3.5 4

4.5	5	*excellent*

Rationale (Reflective summary of why rating was assigned):

Technical Quality Section

This program has the following technical capabilities:														
	Good NA		Poor		Good NA		Poor		Good NA		Poor
Reaction to illogical input	3 ☐	2	1	Booting of program	3 ☐	2	1	Help screens	3 ☐	2	1
Reaction to repeated incorrect responses	3 ☐	2	1	Individualized reinforcement	3 ☐	2	1	Student motivation Cost effectiveness	3 ☐	2	1
Correct Grammar and spelling on screen and in documentation	3 ☐	2	1	Quality of speech synthesis Adjustable sound levels	3 ☐	2	1	Instructions are clear and easily accessed	3 ☐	2	1
Use with peripherals Way to exit activity	3 ☐	2	1	Clear graphics	3 ☐	2	1	Help messages are easy to understand and helpful	3 ☐	2	1
Avoids stereotypes	3 ☐	2	1	Program can handle multiple users	3 ☐	2	1	Program operates without crashing	3 ☐	2	1
Graphics are age appropriate	3 ☐	2	1	Content is accurate Program can be run without technical expertise	3 ☐	2	1	Program can be operated though multiple means	3 ☐	2	1
	3 ☐	2	1		3 ☐	2	1		3 ☐	2	1
					3 ☐	2	1				

My Rating of Technical Quality: (Mark one) *excellent*	*poor*	1	1.5	2	2.5	3	3.5	4	4.5	5

Summary Section

Bring forward ratings and summarize here.

Documentation/ Content Rating	Learning Considerations Rating	Universal Design Considerations Rating	Technical Quality Rating	Overall Rating (Mean score)

Overall strengths of program	Overall weaknesses of program

Describe characteristics of students for whom software is well suited

Discuss changes that might be made to the software that would improve its effectiveness

This evaluation tool was adapted from the following resources: Sector Courseware Evaluation Forbs by Reid, Allard & Hofmeister of Utah State University, Uconn Educational Software Evaluation Form by Sweeney & Rucker, and Blackhurst's Technology Self-Assessment for Special Educators.