



oMERO Project
an eu curriculum for visual disabilities Rehabilitators

Lesson Plan
“REALTER simulation for indoor environmental scanning”

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GENERAL INFORMATION - INTRODUCTION							
TITLE	REALTER simulation for indoor environmental scanning						
ADDRESSED LOs	<p>LO4-H-K-J-1 Know environmental scanning and indoor/outdoor exploration principles and strategies for VIPs and teach them, taking into account personal residual vision, different conditions and settings and safety issues</p> <p>LO4-A-2 Implement Orientation and Mobility (OM) techniques, for indoors and outdoors</p> <p>LO4-G-I-1 Teach the use of mobility aids, including technological ones, integrating them with the proper OM techniques and safety alerts</p>						
IMPLEMENTED INNOVATIVE STRATEGY	<p>Multiple practical exercises are essential to learn the techniques of orientation and mobility addressed by UoL4. Role-playing under low vision simulation such as the one provided by REALTER will allow for an introspective analysis aimed at deconstructing the "habits and biases of sighted people".</p> <p>This lesson plan develops accompaniment and re-education skills that can be transposed to any task in the field of orientation and mobility, in assistance with daily life or other accompaniments. This will require the integration of sufficient time and appropriate premises.</p> <p>This lesson plan requires the REALTER system, properly installed and functioning. Similar visual experiences can be conducted using physical handcrafted devices such as, for example, cardboard apertures and field-of-view limiters.</p> <p>REALTER, a wearable egocentric altered reality simulator based on HMD technology, shows how innovative tools and technology can improve techniques and competences with a modular approach during the training process.</p>						
STRUCTURE OF THE LESSON	<table border="1"> <tbody> <tr> <td><i>Activity 1</i></td> <td><i>Introductory lesson</i></td> </tr> <tr> <td><i>Activity 2</i></td> <td><i>Simulation setting and implementation</i></td> </tr> <tr> <td><i>Activity 3</i></td> <td><i>Simulation report</i></td> </tr> </tbody> </table>	<i>Activity 1</i>	<i>Introductory lesson</i>	<i>Activity 2</i>	<i>Simulation setting and implementation</i>	<i>Activity 3</i>	<i>Simulation report</i>
<i>Activity 1</i>	<i>Introductory lesson</i>						
<i>Activity 2</i>	<i>Simulation setting and implementation</i>						
<i>Activity 3</i>	<i>Simulation report</i>						
DURATION	<p>Overall duration 10 hours and 30 min.</p> <ul style="list-style-type: none"> - Activity 1: Introductory lesson (30 min) - Activity 2: Simulation setting and implementation (6 hours) including face-to-face lessons, homework and independent group simulation sessions. - Activity 3: Simulation report (1 hour and 30 min for the discussion + 2 hours for homework). 						
OTHER LOs WHICH CAN BE TARGETED BY ADAPTING THIS LESSON PLAN	<p>LO12-F-1 Competences related to the LO stating: "Train relatives and informal carers about the needs and feasible goals related to visual impairment according to a child's development age, and train them to use compensatory strategies and adaptive techniques in activities of daily living (ADL)"</p> <p>LO16-A-1 Competences related to "Safety"</p>						

ACTIVITY 1: INTRODUCTORY LESSON	
DETAILED DESCRIPTION OF THE ACTIVITY	<p>This Activity is a traditional face-to-face lesson dealing with environmental scanning principles and strategies, with particular regard to the patient's visual condition. Particular attention is paid to scanning strategies in the event of central scotomas or tunnel vision condition, such as the following:</p> <ul style="list-style-type: none"> - <u>peripheral visual field deficit</u>: exploring the environment - scanning strategies through head movements, and visual search movements, fast saccadic eye movements within the residual visual field.

	<ul style="list-style-type: none"> - <u>central scotoma</u>: exploration of the environment - scanning strategies through saccadic eye movements and slow compensatory head rotations. - <u>saccadic movements</u>: rapid voluntary movements that occur during visual exploration. Saccadic movements have the function of moving the important points of the environment we are observing towards the retinal area of preferred sensitivity. <p>The teacher introduces and discuss the function of shifting fixation to the preferred retinal locus (PRL), by the need of orientation of the preferred retinal locus toward a stimulus, an object that is in the visual field and toward which the subject directs his/her visual attention. (The greatest difficulty will be to maintain a stable fixation in a peripheral point different to the retinal center, for subjects who have a central scotoma)</p> <p>Teachers also remind the correct communication approach and useful instructions to keep in mind while performing rehabilitation, the position to take in relation to the VIP, safety issues, environmental characteristics to be considered.</p> <p>The lecture can be delivered face-to-face or, alternatively, it can be presented in an online web-conference.</p>
ROLE OF THE TEACHER	The teacher is a speaker in a traditional face-to-face lesson.
STUDENTS INVOLVEMENT AND POSSIBLE GROUPS	The whole class is involved.
DURATION	30 minutes
NEEDED ICTs and/or DEVICES	<p>If the lecture is delivered face-to-face: computer, video projector and audio speakers.</p> <p>If the lecture is delivered online: computer + videoconferencing system.</p>
ASSESSMENT OF THE ACTIVITY	Comprehension and practical application will be evaluated by observing the students in Activity 2 and through the final report expected in Activity 3.

ACTIVITY 2: SIMULATION SETTING AND IMPLEMENTATION	
DETAILED DESCRIPTION OF THE ACTIVITY	<p>Activity 2 is a simulation where students are asked to play alternately the role of VDR, VIP and observer.</p> <p>The activity is introduced by the teacher to the whole class and then is performed by students in groups of 3 people in a simulation room equipped with the REALTER.</p> <p>The Activity envisages 3 main STEPS:</p> <p><u>STEP 1 - INTRODUCTION</u>: The teacher takes the class to the room selected for the simulation.</p> <p>He/she introduces and describes the indoor room available for simulated activities in terms of:</p> <ul style="list-style-type: none"> - characteristics of the room and safety issues; - ICTs characteristics and REALTER functioning; - observation tools (i.e. video recording, one directional glass if available, checklist or document) and principal functional factors to be noted <p>Students will be provided with written information on safety and the use of the simulation room which must be signed under their own responsibility. User</p>

	<p>instructions on ICT apparel, explaining the use of REALTER in simulation context and safety, will be shared with students (online or printed).</p> <p>The teacher also explains the simulation goals and roles, asking the students to create groups of 3 members and take turns in playing the role of VDR, VIP or observer (role rotation).</p> <p>STEP 2 – PREPARATION</p> <p>Every group books the simulation room for 2 different simulation sessions:</p> <ul style="list-style-type: none"> - one to delve into tunnel vision condition (1h 30') - one to work on central scotomas (1h 30'). <p>By booking the room, groups will run STEP 3 in different times, independently, without the support of the teacher.</p> <p>Each student is invited to prepare the planned sessions defining in advance the workflow of a 20-minute rehabilitation session they will lead while playing the role of the VDR (once for tunnel vision condition, once for central scotomas). Planning the session, they have to:</p> <ul style="list-style-type: none"> - consider the characteristics of the simulation room, - consider in advance whether the environment is simple or complex, e.g. taking into account the level of crowding of objects, whether it is a real or laboratory context, whether the VIP should be aware or not of this information, the simulated visual condition and/or other concurrent possible conditions. Moreover, they will consider lighting options, starting position, goal setting and operative instructions, etc. <p>STEP 3 - IMPLEMENTATION</p> <p>This step is performed by each group independently in a pre-defined booked session, without the support of the teacher.</p> <p>During their turn as a VDR, students perform the rehabilitation activity programmed in STEP 2, giving instructions to the student playing the role of the VIP, facing upcoming difficulties, following the exploitation and safety conditions, and providing feedback at the end.</p> <p>The student playing the role of the Observer is asked to observe silently his/her groupmates and evaluate their performance, by choosing between checklists (possibly suggested) and annotations on the main functional factors explained by the teacher. At the end of the session, the Observer gives a verbal evaluation and feedback to the VDR. Then, the simulated VIP could also give some advice to discuss the performance.</p> <p>Finally, the task is undertaken by another student in order to complete the rotation of the three groupmates in the same simulation session.</p> <p>Every group performs 2 different simulation sessions:</p> <ul style="list-style-type: none"> - one to delve into tunnel vision condition (1h 30') - one to work on central scotomas (1h 30').
<p>ROLE OF THE TEACHER</p>	<p>In STEP 1 and STEP 2, the teacher introduces and organizes the simulation activity, answering to operative questions and doubts in order to define the tasks and details of the simulation.</p>
<p>STUDENTS INVOLVEMENT AND POSSIBLE GROUPS</p>	<p>The whole class is involved in STEP 1 and STEP 2.</p> <p>STEP 3 is carried out in groups of 3 students. The groups can be selected by the teacher or autonomously by students during STEP 2. It is fundamental that each student performs the three roles assigned (VDR, VIP and observer), if possible, by changing the person being guided within the groups, and thus performing the VDR-patient relation with one colleague in case of tunnel vision and with the other one in the scotoma simulation.</p>

DURATION	<p>STEP 1: 1 hour</p> <p>STEP 2: 2 hours homework (planning VDR session)</p> <p>STEP 3: 1h and 30 min per each session (2 sessions) per each group</p>
NEEDED ICTs and/or DEVICES	<p>Video projector and slides to describe the organization of simulation sessions, the roles to be played and the objectives.</p> <p>REALTER (wearable egocentric altered reality simulator, based on HMD technology) in a dedicated working area (minimum 2 m x 1.5 m), where the external base stations can be assembled (see DK10-REALTER for further details).</p> <p>REALTER functionalities can be presented to the class in the dedicated room, through a demo, or by showing demonstration videos.</p>
ASSESSMENT OF THE ACTIVITY	Organization, leading and analysis will be evaluated through the reporting session (activity 3)

ACTIVITY 3: SIMULATION REPORT	
DETAILED DESCRIPTION OF THE ACTIVITY	<p>In this activity, every student is asked to write a report about the two simulated sessions in which he/she played the role of a VDR (Activity 2 – Step 3). The report should include:</p> <ul style="list-style-type: none"> - a description of the whole programmed session, from the objectives to the tasks; - an overall self-evaluation, taking into account the notes provided by the observer and the comments of the simulated VIPs; - final conclusions about how to improve their rehabilitation approach or about the difficulties that should be taken into account in advance. <p>The report should be sent to the teacher and then discussed in class.</p> <p>The discussion may be organized alternatively as follows:</p> <ol style="list-style-type: none"> a. each group is invited to present their own experiences in a 10-minute presentation to the whole class. After each group presentation, the teacher encourages a discussion; b. based on the reports received by students, the teacher prepares a brainstorming session for the whole class supported by “trigger questions” displayed on a board or on a screen.
ROLE OF THE TEACHER	The teacher is a moderator of the discussion session.
STUDENTS INVOLVEMENT AND POSSIBLE GROUPS	<p>Students are asked to work individually at home in order to produce the report.</p> <p>Then, they are involved in a face-to-face discussion.</p> <p>In the event that groups are invited to introduce their work, groups may also present to the class their experience.</p>
DURATION	<p>2 hours at home to produce the report</p> <p>1h30 in class for the discussion</p>
NEEDED ICTs	None
ASSESSMENT OF THE ACTIVITY	<i>The assessment will be based on the report: on the completeness, clarity, ability to synthesize and level of good organization of the activity.</i>

GENERAL INFORMATION – SUM-UP

CONTENT DETAILS	<ul style="list-style-type: none"> • Environmental scanning principles and strategies with particular regard to the patient's visual condition • Best practices about how to organize a mobility and orientation session • Observation, analysis and evaluation of a rehabilitation session • Techniques of orientation and mobility • Introspective analysis aimed at deconstructing the "habits and biases of sighted people"
REFERENCE MATERIALS	<p>[Paper]</p> <ul style="list-style-type: none"> • Safety and use of the simulation room, instructions (online or printed). • Responsibility document, to be signed by students for the use of simulation room and ICTs (printed). • User instructions on ICT apparel, use in simulation context and safety will be shared (online or printed). • Observation checklist (optional). <p>[VIDEO]</p> <p>REALTER demonstration videos accessible at YouTube channel: https://www.youtube.com/channel/UCgL_gWw626D3nnwFz3zwFA/featured . The videos have been recorded during live testing sessions of the REALTER system and show the user's perspective (i.e., what she/he was seeing through the google).</p>
TEACHER PROFILE	<p>OM Trainer and/or Orthoptist</p> <p>Competences needed:</p> <ul style="list-style-type: none"> - Awareness of environmental scanning - Awareness of mobility and orientation techniques - Ability to organize group-works - Ability to communicate and evaluate the VDR role in practice
ONLINE LEARNING	<p>The lecture of Activity 1 can be presented in an online web-conference.</p>
ICTs SUPPORTING THE LESSON	<p>REALTER is needed. It is an integrated system based on (1) a see-through HMD system (with an embedded eye-tracker) and a (2) software library for simulating altered vision.</p> <p>The REALTER software will be installed on a dedicated PC.</p>
CHARACTERISTICS OF THE FACE-TO-FACE LEARNING ENVIRONMENT	<p>A classroom for activities 1, 2 and 3 equipped with:</p> <ul style="list-style-type: none"> - a pc and ICTs for projecting slides. - Mobile chairs in order to support working groups - A board to support the final discussion. <p>In Activity 2, students need to enter a simulation room, namely a dedicated working area (minimum 2 m x 1.5 m) where the external base stations can be assembled (see DK10-REALTER for further details). Furniture and lights can be chosen and set by the teacher.</p>
NUMBER OF STUDENTS INVOLVED AND POSSIBLE GROUPS	<p>The class can have up to 30 participants, which will be divided into groups of 3.</p>