LEARNING OF CLINICAL OPTOMETRY IN A SOCIO-HEALTH CONTEXT

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Abstract

The aim of the Degree in Optics and Optometry (DOO) of the University of Santiago de Compostela (USC) is to produce highly-qualified specialists in visual healthcare by organising activities aimed at the prevention, detection, analysis and treatment of alterations in vision. On the other hand, one of the objectives of the University is the integral formation of the students, as professionals and as citizens. The European Higher Education Area involves changes in the teaching methods, as well as in the learning processes, which focus its attention on the students. In this framework, a new educational experience was carried out in the subject Optometry IV (3rd course of DOO-USC). This activity consisted in the development of clinical practices in a real clinical socio-health context. The objective is to bring the students closer to the reality of their future profession through an autonomous, reflexive and collaborative learning.

Methodology: this educational experience was developed in two government nursing homes of the city of Santiago de Compostela. The students (50 enrolled / course), assisted by a teacher, develop a total of 100 hour of clinical practice (groups of 2 students, optometric evaluation of the residents) in order to acquire the competencies of the DOO, that is considered as a health profession (Law 44/2003, of 21 November, on Organization of Health Professions). Before the beginning of the activity the equipment for optometric evaluation was transferred to the nursing homes. A “work area” was selected according to the standards established in terms of dimensions and lighting conditions. Written informed consent and data protection document were obtained from all the residents. All the students developed a portfolio of activities. The tool to evaluate the student’s competencies was a rubric.

Results: the portfolio allowed the students to keep a record of their activity in the practices, to reflect on the acquired learning and to make a constructive criticism about this model of practical learning experience. A total of 90 optometric evaluations were recorded in the 50 portfolios delivered by the students, that allowed the students to acquire specific and transversal competencies (analysis and synthesis capacity; work in a team; autonomous, reflexive and critical learning, etc.), as well as competencies for life (development of an ethical commitment; promotion of interpersonal relationships, etc).

Conclusions: this model of learning through clinical practice in a real socio-health environment has allowed to detect vison problems of people living in homes and that the students are aware of the real usefulness of their future profession. There has been a high degree of acceptance of this model of clinical practice and 100% of students consider that it should be included in other subjects of the DOO-USC.

1 INTRODUCTION

The purpose of the Degree in Optics and Optometry (DOO) studies at the University of Santiago de Compostela (USC) is to train highly qualified graduates for primary health care in visual health. One of the objectives of the University is the comprehensive education of its students, as professionals and as citizens. Given the importance of the European Higher Education Area (EHEA) in the teaching approach [1] and learning processes, which now focus on the student, we have considered a change in the design and implementation of the type of clinical practice that our students should receive in the subject Optometry IV (3rd year of DOO) at an educational and sociosanitary level. The aim is to bring them the reality of their future profession using an independent, reflective and collaborative learning process that improves the acquisition of specific competencies, as well as transversal competencies and competencies for life.

253 million people worldwide are 50 or more years old and 65% of them have some uncorrected refractive error which is the cause of their visual impairment [2]. Because most of vision problems do not occur with episodes of pain, visual health is usually not prioritized and there is a lack of routine eye examinations, especially in the most disadvantaged groups and societies. Vision loss affects quality of
life with functional, psychological and social effects [3,4,5]. In general, older people consider poor vision something "proper to their age" to which they must adapt and often overestimate their visual capacity and the limitations that result from the visual deterioration [6].

Prevalence of visual impairment increases among institutionalized older adults respect to non-resident population. An investigation developed by Dual Sensory Loss Unit of the USC studied the visual status of older adults living in government nursing homes of Santiago de Compostela [7]. The study showed a high percentage of elderly people with a visual acuity (VA) less than 20/40 (37.5%); level of vision that affects the development of certain daily activities [8]. In many cases, the "poor vision" of the residents was due to uncorrected refractive errors, which were justified by the absence of optometric checks or an adequate optical correction. From these results, we detected a real need: to act on institutionalized older people who present some visual deficit given the negative impact of this sensory dysfunction on the aging process [9].

Given this reality, a new model of clinical practice in a real socio-sanitary context has been launched: the innovation project in learning-service (ApS) “Senior Optometry”. The teachers of the subject Optometry IV (members of Dual Sensory Loss Unit) designed a model of clinical practice in which students perform their clinical practices with institutionalized residents with low-resources by the purpose of responding the social need detected.

“Senior Optometry” is the first ApS project in optometry at the USC. Other ApS experience in optometry has been developed in the Faculty of Optics and Optometry of Tarrasa [10] and the optometry program of the International Service-Learning organization [11] carries out learning-service experiences that offer to associated communities a service that includes visual screening, visual health education tasks, assembly and distribution of glasses and referrals to specialized care when necessary. These two ApS projects have been developed only with those students who decide to collaborate voluntarily, not with the total of students enrolled in the subject.

The change in the form of teaching and learning required by the EHEA implies a transformation of teaching methodologies with the incorporation of participative actions focus on students, which act in a more autonomous, reflective and critical way [12]. This model of higher education improves competency-based learning, acquiring the teacher a role of supervisor while increasing the responsibility of the student on their own learning [13]. As a result, it is necessary a modification of learning tools and evaluation systems, being the portfolio and rubrics two of the strategies used.

The portfolio implies a methodology of work and a didactic strategy in the teacher-student feedback. Together, it is an evaluation method that allows collecting evidence to emit a valuation as close as possible to reality, which is very difficult through more traditional assessment instruments [14]. In this sense, some authors affirm that the introduction of portfolio in education responds to the need to look for more qualitative (instead of quantitative) methodologies to evaluate learning [15]. In recent years, the use of the portfolio has been progressively extended. It has been utilised in clinical practice for the student to reflect on their own practice as well as an instrument of evaluation, something very necessary in optometry clinical practice [16,17,18].

On the other hand, evidences exist that the use of rubric as evaluation tool can be useful to obtain evidences that students achieve their level of competence, are able to demonstrate their knowledge and reflect critically [19].

2 METHODOLOGY

2.1 General description

This kind of clinical practice, developed through the ApS project “Senior Optometry, allows us to access a total of 234 institutionalized older adults, a population group with low-economic resources, a high percentage of women and a mean age around 80 years. They are fragile patients with pluripathology, functional and psychic limitations and a high percentage of dependence. The clinical practice was developed in 3 general phases:

2.1.1 Phase I: contact with the partners

We contacted the Department of Social Policy of the Xunta de Galicia with the objective of obtaining authorization to perform clinical practice in the collaborating nursing homes through the Joint Agreement with the USC. We also contacted with entities to get the approval to carry out the activity in
each nursing home. The medical staff determined which residents can participate in the learning-service activity. Two government nursing homes in the city of Santiago de Compostela (Galicia, Spain) accepted the invitation to participate in the ApS project (academic year 2017/18).

2.1.2 Phase II: performance of the ApS project

The innovation project in learning-service “Senior Optometry” involved all students enrolled in the subject Optometry IV. It means a total of 50 students in the 2017/18 academic year. The 50 students formed 25 groups (2 subjects/group). The number of hours of clinical practice was 100 hours, therefore each group performed 4 hours. The timetable of the ApS activity was from 10.00 h-13.00 h (1hour/group) and we established a group rotation system (Fig. 1), so that 6 students rotate daily (3 groups) and 3 older adults were evaluated.

Each group performed a total of 3 rotations (equivalent to 3 hours of clinical practice) in the nursing homes. The remaining time to complete the total hours of clinical practice was dedicated to personal work (preparation of optometric and portfolio reports). We made available to students a calendar for carrying out the ApS experience. The students had to select the days to perform their clinical practice (groups of 2 students; timetable compatible with the rest of the teaching program of the faculty) which was sent to nursing homes before development of clinical practices.

![Group rotation system](image)

This ApS experience tries to cover the visual needs of the older adults with low resources living in government nursing homes. Therefore, the clinical practice consisted of optometric evaluation of the residents.

Before starting clinical practices, we explained to the students what the ApS Optometry Senior project consisted of. Instructions were also given regarding how they should behave in nursing homes. The ApS portfolio was provided and explained (Fig. 2). Students had to deliver the portfolio at the end of the clinical practice. The delivery of the portfolio was mandatory. In addition, the equipment for optometric assessment (VISIONIX L40 19 optotype screen, near vision charts, test lenses, retinoscope, ophthalmoscope, biomicroscope, etc.) was transferred to nursing homes. A "work area" was selected according to the standards established in terms of dimensions and lighting conditions (lighting level 500 lux). Optometric evaluation was carried out under supervision of specialized teaching staff (opticians-optometrists) in all clinical practice sessions. As evaluation tools we utilized the portfolio and a rubric (Table 1).

The methodology used in practical teaching complies with the clinical protocol and the ethical principles required by the Bioethics Committee of the USC. Signed informed consent was also obtained from all of the participants at each examination, in accordance with Organic Law 3/2018, of 5 de December, on the Protection of Personal Data, and guarantee of digital rights [20].
**PORTFOLIO OF ACTIVITIES: learning-service project “SENIOR OPTOMETRY”**

**SUBJECT OPTOMETRY IV -------3rd course DOO**

**Nursing Home:**

**Description:**

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**Faculty contacts Nursing Home**

**Clinical Practice students contact older adults**

**Results students deliver a report of their work**

**1st/2nd/3rd….. ROTATION**

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**NOTEBOOK OF SESSIONS**

| Student........................................................................................................ Day................ |
| Patient/s........................................................................................................... Age.................... |

| Patient characteristics (description of general, functional and visual state of the patient). |

| Optometric tests (description of clinical procedures) |

| Personal experience (experiences, anecdotes, feelings, etc) |

| LEARNING (with this model of clinical practice you have learned to…) |

**Specific competences:**
- optometric evaluation
- prescription of optical systems
- prevention, detection and improvement of the older adult vision
- visual screening
- contrast sensitivity test
- colour test

**Transversal competences:**
- communication
- organization
- planning
- analysis and synthesis capacity
- problems solving
- decisions making
- teamwork
- ethical commitment
- autonomous learning.

**Competences for life:**
- interpersonal relationships
- adaptation to new situations
- motivation
- overcoming frustrations
- critical / self-critical ability

**Learning-service project:**

a) Strengths
b) Weaknesses

**IMPROVEMENT PROPOSALS**

In relation to this patient, you have to indicate the most important deficits detected, possible solution and optometric management.

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*Figure 2: Original portfolio used in the ApS activity “Senior Optometry”*
<table>
<thead>
<tr>
<th>Dimension/Criteria</th>
<th>Regular</th>
<th>Good</th>
<th>Excellent</th>
<th>%Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Specific Competences</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development of anamnesis</td>
<td>The student gets relevant information about 3 or less data</td>
<td>The student gets relevant information about 4 data</td>
<td>The student gets relevant information about 5 or more data</td>
<td></td>
</tr>
<tr>
<td>Clinical exploration &amp; Data collection</td>
<td>The student compiles 1 relevant element and makes 2 or more activities correctly. No indicate diagnostic tests.</td>
<td>The student compiles 1 relevant element and makes 3 activities correctly. The student indicates 1 o 2 diagnostic tests.</td>
<td>The student compiles 3 relevant elements and makes 3 or 4 activities correctly. The student indicates ≥3 diagnostic tests</td>
<td>30%</td>
</tr>
<tr>
<td>Clinical judgment</td>
<td>The student doesn’t report clinical information</td>
<td>The student reports some clinical information</td>
<td>The student reports complete clinical information</td>
<td></td>
</tr>
<tr>
<td><strong>2. Transversal Competencies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization &amp; Teamwork</td>
<td>Without organization and teamwork.</td>
<td>Little organization and teamwork.</td>
<td>A lot of organization and teamwork</td>
<td></td>
</tr>
<tr>
<td>Communication ability</td>
<td>Poor communication with patient and professor</td>
<td>Quite communication with patient and professor</td>
<td>Good communication with patient and professor</td>
<td>30%</td>
</tr>
<tr>
<td>Problems resolution &amp; Decision making</td>
<td>The student doesn’t solve problems and doesn’t makes decisions.</td>
<td>The student solves some problems but doesn’t makes decisions.</td>
<td>The student solves problems and makes decisions.</td>
<td></td>
</tr>
<tr>
<td>Autonomous learning</td>
<td>No autonomous learning</td>
<td>Little autonomous learning</td>
<td>Full autonomous learning</td>
<td></td>
</tr>
<tr>
<td><strong>3. Competencies for life</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adaptation to new situations</td>
<td>No adaptation to new situations</td>
<td>Problems with new situations</td>
<td>Good adaptation to new situations</td>
<td></td>
</tr>
<tr>
<td>Motivation &amp; Initiative</td>
<td>No motivation and initiative</td>
<td>Little motivation and initiative</td>
<td>Full motivation and initiative</td>
<td>40%</td>
</tr>
<tr>
<td>Interpersonal relations</td>
<td>Without empathy</td>
<td>Empathy only with patient</td>
<td>Empathy with patient and professor</td>
<td></td>
</tr>
<tr>
<td>Reflection &amp; Critical thinking</td>
<td>No reflection and critical thinking.</td>
<td>Little reflection and critical thinking.</td>
<td>Full reflection and critical thinking</td>
<td></td>
</tr>
</tbody>
</table>

2.1.3 **Phase III: results analysis**

The results obtained in the clinical practice are analysed through the assessment of the portfolio that each student deliver at the end of the ApS activity. In this portfolio students collect data about elderly nursing homes, the activities carried out and the strengths and weaknesses of clinical practice. There is also a reflection on the experience of ApS on a personal and professional level. Students were guaranteed confidential management of the information obtained.

A descriptive and qualitative analysis of the data collected in the portfolio is carried out, compiling information on the competencies and evidences acquired or individual learning samples (reflections, experiences, suggestions for improvement, etc.).
3 RESULTS

3.1 Optometric evaluation

The number of seniors evaluated at the end of the clinical practices was 90 (range age 60-95 years). Uncorrected refractive errors were detected on 48 of the residents examined and one subject was referred urgently to the specialist and ocular health treatment (eyelid hygiene) was prescribed for 80.0% of the subjects.

3.2 Acquired learning

The learnings indicated in the portfolio from the perspective of the students were:

1 Acquisition of specific competencies of the degree: 92.2% of the students indicate in the portfolio that they improved their ability to perform a visual examination to an older person and 85.1% say they were trained in the detection and prevention of vision anomalies (Fig. 3).

<table>
<thead>
<tr>
<th>SPECIFIC</th>
<th>TRANSVERSAL</th>
<th>FOR LIFE</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 92.2% Improve visual examination capabilities</td>
<td>• 75.0% increase communication capacity</td>
<td>• 90.7% adaptation to future professional situations</td>
</tr>
<tr>
<td>• 85.1% Form in detection of vision anomalies</td>
<td>• 91.5% encourage teamwork</td>
<td>• 78.2% promotes motivation</td>
</tr>
<tr>
<td></td>
<td>• 68.0% learn to make decisions</td>
<td>• 26.0% overcome frustrations</td>
</tr>
<tr>
<td></td>
<td>• 70.6% develop ability to solve problems</td>
<td>• 78.7% improve capacity to relate to others</td>
</tr>
<tr>
<td></td>
<td>• 74.3% promote autonomous learning</td>
<td>• 73.0% stimulate capacity for criticism and self-criticism</td>
</tr>
<tr>
<td></td>
<td>• 80.5% improve capacity of organization and ethical commitment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 70.2% increase personal initiative</td>
<td></td>
</tr>
</tbody>
</table>

Figure 3: Acquired competencies indicated by the students in the portfolio

2 Acquisition of transversal competencies: 75.0% of the students affirm in the portfolio that they improved their communication skills, 91.5% believe that this experience stimulates teamwork and 68.0% believe that they learnt to make decisions. At the same time, a high percentage of students report an increase in their ability to solve problems (70.6%) and personal initiative (70.2%). The proportion of students who believe that the APS experience promotes autonomous learning and the capacity for organization and ethical commitment is also high (Fig. 3).

3 Acquisition of life competencies: the results of the portfolio show that 90.7% of the students consider the experience as an adaptation to futures situations of their profession and 78.2% said that promotes motivation. A high proportion of students indicates that their ability to relate to others has improved (78.7%) and that the experience stimulated their capacity for criticism and self-criticism (73.7%). It should also be noted that 26.0% of students consider they have
overcome frustrations such as "not being able to do "or fear of facing a geriatric patient "(Fig. 3).

3.3 Students reflections

Among the reflections related to the experiences and feelings generated by the clinical practice, the students highlight the benefits that this activity provides for learning from a professional point of view. They also consider that this type of practical-clinical teaching allows them to develop skills to treat patients with low collaboration:

"Through this experience in nursing homes, we have learned to manage and confront patients who do not collaborate (...)".

The students also consider that the ApS experience is an approach to the real world and the reality of the profession:

"This experience has allowed me to see what this profession really means".

They reflect in the portfolio the satisfaction of a job well done and consider the activity “useful” and “very rewarding”. The students begin to perceive the important role of the optometrist as primary care professional:

"We have been able to help older people to perform daily tasks improving their vision".

"We have seen real problems".

The students have seen the activity as "different from what they are used to," noting that having more autonomy to work produces a sense of responsibility:

"We have learned to adapt to the needs and personal situation of the patient"

"We had to take the initiative (...) is the first time we made decisions about the patients optometric management and it is a great responsibility"

The portfolio reflects that the students demand a greater presence of this type of experiences in their training:

"The number of practical hours in the nursing homes should be greater."

"I think it would be interesting to extend this type of experience to other subjects of the degree."

3.4 Rubric as evaluation tool

We have observed that the rubric of qualification designed to evaluate the competences acquired in clinical practice allowed a more objective evaluation of the student's work. However, we have noted that the criteria established to evaluate the acquisition of competencies do not completely adjust to the learning required for students. At the same time, we have detected a lack of dynamism in the use of the rubric, making it difficult to perform an evaluation in a short time.

4 CONCLUSION

Through the ApS project Senior Optometry, the students initiate direct contact with their future profession and the real work world. This model of clinical practice represents this the first contact of the students with a geriatric patient.

The learning-service activity developed in the subject Optometry IV favours and enhances the work and the multidisciplinary interrelation between health professionals in order to optimize the care of the elderly residents and improve their quality of life. It also strengthens the sense of responsibility of students, who must follow the norms of the entities and carry out an ethical and professional work. Together, this ApS activity contributes to the formation of moral values, promotes respect for the older people and students participate in the socio-sanitary dimension of the visual deficit.

The portfolio is the space where students reflect on their own learning, allowing them to be more aware of the social dimension of their future profession and their own limitations. The implementation of the portfolio has allowed a better monitoring of the student learning in clinical practice. We consider
that it can be a good evaluation tool since it allows us to visualize the implication and the work carried out by the student.

It should be noted that the information that the student reflects in the portfolio may be conditioned by the degree of difficulty of the geriatric patient and by the degree of personal involvement, given that some students had not chosen the DOO as first option.

We consider that the problems detected during the use of the rubric are due to the numerous and different variables that must be measured in this model of clinical practice to get a complete evaluation of our students. In this regard, it is necessary to readjust the criteria established in the different evaluation dimensions in order to achieve a more useful and practical rubric.

REFERENCES


