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Intervention in Voice and University Education (iVEU)

A Teaching Innovation Project in Speech-Language Pathology Degree

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1. ABSTRACT:

The results of an action research on the first phase of the iVEU project (Intervention in Voice and University Education) are presented. This innovative project involves a voice therapy service and different courses of the Speech-Language Pathology Degree at the Universitat Autònoma de Barcelona, and has educational, voice therapy and research objectives. Multidisciplinary experiences are designed for the early detection of dysphonic students, diagnosis, intervention, referral to health professionals, and follow-up, within the context of different Degree courses. The project undergoes continued evaluation based on the opinions of the students and professors involved in the study.

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2. RESUMEN:

Se presentan los resultados de una investigación-acción sobre la primera fase del proyecto iVEU (intervención en Voz y Educación Universitaria), una innovación que vincula un servicio asistencial en logopedia de voz y diferentes asignaturas del Grado en Logopedia de la Universidad Autónoma de Barcelona con una triple finalidad: educativa, logopédica e investigadora. Se diseñan experiencias multidisciplinares orientadas a la detección precoz, valoración, intervención, derivación y seguimiento de alumnos con disfonía en el contexto de las asignaturas del Grado. El proyecto se somete a una evaluación continua basada en las opiniones de los estudiantes y profesores que participan en el estudio.

3. **KEYWORDS:** higher education, speech-language pathology students, prevention of voice disorders

4. FIELD OF KNOWLEDGE:

- Health Sciences

5. SUBJECT AREA:

- Innovation In Higher Education

6. PRESENTATION CATEGORY:

- Oral Presentation

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7. DEVELOPMENT:

a) Justification

In this communication we present the results of an action research associated with the first phase of the iVEU project (Intervention in Voice and University Education), an innovative project that stems from the need to solve two problems observed among Speech-Language Pathology (SLP) students: (1) most students feel poorly trained in the field of voice therapy, which is an area that requires very specific training and skills development. (2) A significant fraction of SLP students reach graduation lacking a healthy voice. According to a study by Warhurst and collaborators with Speech-Language Pathology students at the University of Sydney, such fraction is around 47-50%. Their poor vocal quality may compromise their communication effectiveness and/or their ability to accurately exemplify the vocal exercises that they will propose to patients in their future professional practice (Warhurst *et al.*, 2012).

Teaching is the most common job among the population suffering from voice disorders (Fritzell, 1996). For such reason many studies on the prevalence and prevention of dysphonia among teachers and future teachers have been published. The results of these studies support the need to examine students with early vocal symptoms, and also the need to include vocal education courses in teacher training programs (Simberg *et al.*, 2000).

On the contrary, vocal health among Speech-Language Pathologists and SLP students has generated a limited number of scientific reports. It is, notwithstanding, a significant problem,

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which we believe must be tackled. Despite prevalence is lower than among Teaching students (21%), or among overall University students (17%), according to Gottliebson and collaborators voice disorders among SLP students are more frequent than among the general population (12% vs 3-9%). The results in his study of prevalence in the state of Ohio suggest that the professors of SLP courses should identify students with voice problems and emphasize the optimal use of voice in the classroom and in the clinical practice (Gottliebson *et al.*, 2007). From the context of the Speech-Language Pathology Degree at the Universitat Autònoma de Barcelona (UAB), and looking for ways to address such questions, we have started the first steps of the innovative project that we present here.

b) Context of the research

The innovative project that we present here, the iVEU project, has three goals:

1. To offer SLP students a more integrated knowledge regarding assessment and therapeutic intervention in voice disorders.
2. The early detection of students with voice problems, to carry out a speech therapy evaluation, intervention, referral and follow up if necessary.
3. To initiate a research project on the prevention of vocal health and the education of SLP students.

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This is therefore an innovative project that brings together three different areas: **education, research, and therapy**. The project involves the Voice Unit (UdV, a voice therapy service recently started at the School of Psychology of the UAB), and different courses of the SLP Degree. To control the quality of the project and to allow for continued improvement, the project undergoes a number of evaluations by the students and professors involved in it.

The first experience of the project (which is the focus of the current action-research) integrates the UdV, the first year compulsory course Acoustic Physics and Audiology (FAiA), and a fourth year Graduation Thesis (TFG). The TFG integrated in this first experience is co-tutored by the FAiA professor and the Professor of the compulsory second year course Voice Disorders, Assessment and Intervention (AVVI, who is also the principal investigator of the iVEU project). The objective of the TFG is to screen FAiA students for dysphonias, and the subsequent SLP and medical diagnosis, SLP intervention, and, whenever necessary, medical referral and follow up. Such first experience is taking place during academic year 2011-2012.

The detection process of FAiA students with dysphonia by TFG students is carried out through three different sources of information:

- Firstly, the G parameter from the subjective and perceptive rating scale of voice quality GRBAS (Hirano, 1981). The G parameter is the most global of 5 making up the scale. It determines the presence or absence of dysphonia and grades the severity from 0 to 3 (where 0 corresponds to a healthy voice, 1 indicates a slight alteration, 2 a moderate alteration, and 3 a severe alteration).

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- Secondly, the Voice Handicap Index (Jacobson *et al.*, 1997) in its 10-item version (VHI-10, Rosen *et al.*, 2004), which is a valuable instrument to assess the self-perception of vocal handicap and has been adapted and validated in Spanish (Núñez-Batalla *et al.*, 2007).
- Finally, the Dysphonia Severity Index (DSI), a multi-parametric index for the objective assessment of vocal quality that combines weighted acoustic and aerodynamic parameters (Wuyts *et al.*, 2000)

To encourage FAiA students to participate in the project, one exercise that contributes to their final grade in the course is derived. Students are asked to calculate their own DSI from the vocal samples that the TFG students record for each of them in a recording studio. This teaching-learning activity justifies the integration of a course such as FAiA in the project.

Once the dysphonic FAiA students are detected, the TFG students offer them 3 sessions of group intervention. The sessions include both vocal hygiene education and vocal resources. The process ends with the issuance of requests for referral to external professionals (SLP therapist, family physician, Ear-Nose-Throat (ENT) specialist, or Phoniatics specialist) or the in-house UdV (SLP therapist) in cases where it is deemed necessary.

An overview of the iVEU project, including this first experience, was given to first year students through a seminar included within the FAiA program, held in November 2011. The seminar was

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delivered by the principal investigator of the project. The seminar also offers the students an opportunity to develop their vocal and perceptive skills. First, the vocal tasks that they will be required to perform at the recording studio are presented, and time is allocated for supervised rehearsal. The objective here is to encourage the development of vocal expertise on first year students.

In addition, a classroom activity is carried out in which the above-mentioned GRBAS scale is presented. Next, several voice recordings are played, and students are asked to assign a G parameter (dysphonia level) to each of them. The objectives of this activity are to introduce first year SLP students to the perceptual evaluation of voice quality, and also to help them understand the need for objective methods for the diagnosis of dysphonia. In turn, the latter emphasizes the utility of the FAiA course for their professional future.

By the end of the course, in January 2012, a closing seminar was held to explain at which point is the dysphonia detection process, to hear the concerns raised by the students, and to give them information about vocal hygiene habits.

Irrespective of whether the diagnosed students take advantage or not of the referrals to be evaluated by external professionals, in later phases of the project (beyond the scope of the current action-research) new activities will be implemented integrating additional courses. The activities will be designed with the objective to follow up the healthcare process of the dysphonic students, and also to generate new learning opportunities for all the students.

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Students with dysphonia will be explored by an ENT specialist, within the hospital practical classes of second year course *Larynx and Resonant Tract Diseases* (MLCR). In addition, dysphonic students will be evaluated by their peers, who will also provide them with SLP therapy treatment as part of their training in the second year course *Voice Disorders, Assessment and Intervention* (AVVI).

Practicum students from third and / or fourth year, who choose to carry out their training at the UdV, will mentor the AVVI students in their role as SLP professionals, accompanying them throughout the learning process. The *Practicum* students will also brief the cases for discussion at the UdV weekly clinical sessions. The AVVI professor will be present throughout the mentoring process, guiding the learning process of both, the AVVI students and the *Practicum* students.

Finally, new TFGs will be designed in upcoming years to ensure the continuity of the project and its evaluation. Also, the iVEU project will expand through new integration experiences with other courses within the SLP Degree, seeking to make sense of the knowledge on voice provided under different courses during the degree.

c) Objectives

The ultimate goal of an action research is to improve the quality of educational activities (Latorre, 2003). Yet, our action research not only aims to improve the quality of the action in the educational dimension of the project, but also in the other two dimensions (voice therapy and

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research). However, the latter two aims remain outside the scope of this presentation. We focus our communication on the educational aspects of the project.

The objectives of this action research are (1) to identify the participants' perceptions about the effects of the innovation activities of the iVEU project: (1.1) in the courses involved in the project; (1.2) in the SLP Degree curriculum; (1.3) in the teaching-learning processes; and (1.4) in the quality of teaching. (2) To gather the participant's suggestions to improve the iVEU project.

d) Description of the work

We gathered data on students' and FAiA and TFG professor's perceptions through (1) two focus groups among FAiA students; (2) a questionnaire addressed to all the FAiA students; (3) a group in-depth interview to the two TFG students involved in the experience; (4) an in-depth interview to the FAiA professor, who also co-tutorizes the TFG involved in the experience; and (5) the University surveys of teaching performance of the last two biennia (2009-2011 and 2011-2013) on the FAiA professor.

One of the two focus groups with FAiA students consists of eight women, three of which enrolled into the SLP Degree directly from high school, three have a professional certificate (CFGs) in oral hygiene, one holds a Degree in Psychology, and one works in personal image counseling. The second group includes eight women and one man, eight of which came directly from high school, the other being a Teacher.

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With respect to the 77 FAiA students who responded to the questionnaire, three of them are men and 74 are women. Their ages range between 18 and 43 years, with an average of 21 years. 16 of the 77 failed to pass the FAiA course on a previous year.

The TFG students group-interviewed in depth are in their 4th (last) year of the SLP Degree. Both are interested in a voice specialization, and both have previous vocal training and experience. One of them has a Teaching Diploma and the other studied Social Education and Psychopedagogy.

Finally, the FAiA Professor and co-tutor of the TFG has been in charge of the FAiA course since the 2008-2009 academic year. It is his first time tutoring a TFG in the SLP field.

e) Discussion of Results

The research findings suggest, according to the different participants, that the first phase of the iVEU project has enabled first year SLP students to **access to voice therapy** in their first semester, at a time in which all the courses are still very preliminary, and are still one year and 3 months away from attending the first voice-focused course, AVVI (second year, second semester). The obtained data underscore the participants' positive evaluation, and perceived relevance of a direct contact with the world of SLP during their first year. Thanks to one such early contact, first year SLP students have the opportunity to ponder the world of voice therapy as an option within the range of SLP specialties they may later on pursue. Going further, one of the TFG students emphasizes that first year students should be given an early background on

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voice similar to those provided by other basic courses such as Anatomy and Physiology or Language Acquisition. With the improvement of the iVEU project in mind, we believe progress in that direction is indeed required.

Apart from direct access to voice therapy during the first year, the research results indicate that this experience also allows FAiA students to **get in contact with research** in the field of voice therapy. Voice therapy research is, as of today, essentially non-existing in our country. This experience makes it present and introduces it as one more professional option to our students.

The data obtained suggest that, thanks to integration between courses and teaching collaboration, the project provides students with a vision of **interdisciplinarity** and teamwork. Interdisciplinarity is a crucial value to instill in SLP students, who as SLP therapists will have to work in teams composed of professionals from different fields (ENT specialists, Phoniatics specialist, Psychologists, and Physiotherapists, among others). According to the collected data, the iVEU project offers such vision since year 1.

Also, according to the collected data, the project provides a practical value to the FAiA course, thanks to the connection between Acoustic Physics and voice therapy. Such fact has contributed to an **improved perception of the FAiA course** by the students. The improved perception is based on a number of observations. As extracted from the responses to the questionnaire, upon completion of the first phase of the iVEU project, 80% of the students claim they have the absolute certainty that FAiA will be useful in their future career. Only 53% thought so prior to the experience. Therefore, after their participation in the experience, students understand better

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the **usefulness** of the FAiA course. In the same sense, students feel that after the experience they have more solid arguments to justify the inclusion of FAiA in the SLP Degree curriculum.

Also thanks to the presentation of the iVEU project, an overall **improved perception of the SLP Degree** is detected among the students. According to the responses to the questionnaire, 72% of the students claim that the iVEU project helps them visualize the **connection** between different courses in the degree. At the level of feelings, 71% of the students claim to feel comforted because the project helps them understand the usefulness of the compulsory courses they must take. Finally, in terms of attitudes, 65% of the students expressed that their participation in the project increases the effort devoted to learning the contents of the participating courses.

The research results also show that putting in contact freshmen students with last year students such as those in the TFG, contributed in 62% of FAiA students to an increased **motivation to learn**. We believe that putting in contact students from different years can be a very useful resource to be considered and promoted. In future research we would like to deepen the study of the consequences of such encounters in the motivation of students, and the implications in the teaching-learning processes. In this way we hope to obtain valid information to optimize the design of the project.

Regarding the perception of the TFG students with respect to the TFG itself, the results suggest that they value very positively the parallels between an inter-disciplinary TFG and their **professional interests** (it is worth reminding here that both students are interested in specializing in voice therapy). In addition, they emphasize the fact that the project involves the students'

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participation. They also stress as positive the fact that students' participation allowed them to **easily access their target population** for the detection of students with dysphonia. Finally, because of direct intervention on dysphonic persons, the TFG students feel they are carrying out a project of great **utility**.

83% of the students participating in the iVEU project claim it will allow them to **develop useful skills** for their future professional practice. The research results suggest that the **assumption of roles** that the iVEU project involves will play an important contribution in the development of such skills. During participation in the project, students diagnosed with dysphonia will assume the role of patients and the rest of fellow students will take the role of voice therapists. Participants believe that the assumption of those roles will contribute to develop professional skills, that can be categorized as follows:

1. Use of SLP instruments.
2. Development of auditory discrimination
3. Achievement of vocal experience as a tool for their future professional practice
4. Development of empathy to deal with future patients

Regarding the **use of SLP instruments**, both FAiA and TFG students stress the importance of having the opportunity to familiarize with the tests used in the detection process of students with dysphonia, with their future as SLP therapists in mind. FAiA students use their studio-recorded voices to calculate their own DSI thanks to the tools they have learned in FAiA classes, and respond to the VHI-10 questionnaire, an index that is widely used in our professional

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environment. TFG students prepare the recording studio, give FAiA students the instructions to record the vocal samples, record the voices, analyze the different voices calculating the DSI and the G parameter of the GRBAS scale, and interpret the results of the VHI-10. According to the research data, such instrumental learning makes them feel confident about using such tools in their professional careers.

The research results also suggest that the development of **auditory discrimination** is one of the major shortcomings in the training that has traditionally been offered in the SLP Degree at the UAB. The TFG students have been able to identify one such deficit thanks to their own experience in the TFG. On the one hand, they identify their own lack of experience when assigning a value to the G parameter of the GRBAS scale of perceptual vocal quality to the vocal samples. Moreover, they observe a significant deficit in self-perception among some of the FAiA students diagnosed with dysphonia, who are unaware of their voice alteration. Such observations lead the TFG students to indicate that the development of auditive discrimination is a skill that should be developed early on in the SLP Degree. However, the questionnaire results show that, as a result of the iVEU project presentation, FAiA students became aware of the voices they hear, and that, in some cases, they have begun to spontaneously analyze differences in voice quality. It therefore seems that the first experience of the iVEU project is helping to improve the lack of auditive discrimination skills among SLP students identified by the two TFG students.

Another major shortcoming in the training of the SLP Degree students at the UAB, as derived from our data, is the achievement of **vocal experience** as a tool to use in the professional practice. The development of such expertise is essential to later address the prevention, diagnosis

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and treatment of voice disorders. The TFG students express that, during their training along the Degree, they have missed the existence of opportunities to experience their own voice. As derived from the research data, thanks to the assumption of roles mentioned above, the iVEU project allows students to start the process to develop vocal experiences as early as during their first year.

With the improvement of the project in mind, and to integrate all the learnings on voice in the Degree, and to start the process of vocal learning at early stages, the TFG students suggest the inclusion of more practical learning with their own voice within the basic theoretical courses, to encourage the development of such expertise. They also suggest the option to enroll the non-compulsory course *Vocal Health and Training* (EVSS), now a 4th year course, earlier on during the Degree. On their own initiative, and with the objective to further integrate learnings from the different courses in the SLP Degree, the TFG students have used resources from EVSS in their design of the intervention with the dysphonic FAiA students.

Finally, the data obtained from the questionnaire show that, in general, the students think that the project helped them to develop **empathy** towards their future patients. FAiA students stress that role playing will help them better understand how a person suffering dysphonia may feel. They believe that it will help them put themselves in the patient's place. On the other hand TFG students do not share such vision. Such difference in emphasis can be analyzed as follows. FAiA students feel the uncertainty inherent to going through a screening process; they contemplate the possibility of being chosen to assume the role of patients; and they know they will be in close contact with classmates that will be diagnosed with dysphonia. TFG students, on the other hand,

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directly assume the role of SLP therapists.

The data obtained in the interview with the FAiA professor suggest that, thanks to FAiA-TFG integration, changes have occurred at different levels. The most obvious innovation has been the **design and implementation of teaching-learning activities** that have integrated both courses (particularly inviting the FAiA students to participate in the TFG for detection of students suffering dysphonia). The integration experience has also helped him **identify content gaps** in his course (such as the value of the acoustic parameters of the voice for objective diagnostic purposes) and **introduce some of those new contents** in the course syllabus this same academic year. Finally, it is worth noting that, unexpectedly, the integration experience has made him ponder the possibility of an **in-depth transformation** of the course next year.

Such potential in-depth transformation of the FAiA course involves innovations at two levels: in relation to the **contents**, and, against all odds, in relation to the **methodology**. In terms of contents, the FAiA Professor is pondering focusing the Acoustic Physics half of his course even closer to the context of voice therapy, in response to weaknesses he has identified in the course contents as a result of participation in the project. The research results thus suggest that project iVEU can facilitate changes in the perception that Professors of basic courses have about what SLP is, and how they can adapt the contents of their courses to the future needs of their students. From this, one may conclude the relevance of the pedagogical role that SLP faculty may play on their fellow faculty in charge of basic courses, to facilitate the adjustment of contents.

Methodological level innovations are not directly related to SLP or the integration project itself,

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but seem to be the result of **teaching collaboration and teamwork** that occurred during this first phase of the iVEU project. It follows that, by facilitating exchange of experiences, peer learning, and reflection on one's teaching practices, the iVEU project not only works towards the integration of courses to improve of the SLP Degree, but also facilitates the improvement of the teaching quality of the involved Professors. Among the methodological innovations provided by the FAiA Professor it is worth stressing a reduction in lectures, and the introduction of the Acoustic Physics contents of the course using the human voice as the object of study from minute one of the course. In this way, and always keeping in mind the interest of SLP professionals, the goal is to encourage the student's autonomous learning under the guidance of their teacher.

f) Conclusions

With respect to the educational contribution, the iVEU project provides first year SLP Degree students access to voice therapy and to research in this area. An improved perception of the FAiA course and the SLP Degree by the students is observed. The improved perceptions may be interpreted as due to the practical value and usefulness in SLP practice that the project confers to the FAiA course, and by the fact that it also contributes to visualize the connection between courses.

In addition, and thanks to the assumption of roles, the iVEU project favors the development of professional skills among students, including the use of SLP instruments, auditory discrimination, vocal experience and empathy.

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Finally, the project facilitates: the design and implementation of teaching-learning activities that integrate different courses; the identification of content gaps in FAiA; the inclusion of new contents in the course syllabus; and the FAiA Professor's decision to better focus his course within the context of the SLP needs, through an in-depth transformation of contents and methodology.

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