



Innovation in teaching
for training in clinical reasoning
of students
of Speech and Language Therapy Degree

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Training in Clinical Reasoning is a challenge of Higher Education in Health Care

Curriculum is based on competencies

- a) That match theoretical knowledge with clinical practice
 - b) In an interactive context with the patient
 - c) From a *constructivist* perspective
- A core competency is Clinical Diagnostic Reasoning (CDR)

Clinical Diagnostic Reasoning (CDR)

1. A set of cognitive processes necessary to evaluate, identify and manage a patient's problem
 - ❖ Hypothetical-deductive thinking strategies
 - ❖ Pattern recognition strategies,
 - ❖ Observational, Reflective, and Inferential Abilities
 - ❖ Integrative Judgement
2. Similar training process across Health Sciences Degrees.
3. Research is widespread in other Health Sciences but not in Speech and Language Pathology (SLP) Degree.

The progressive nature of CDR learning

1. Preclinical stage

Novice students store theories and concepts knowledge and practical principles about the causes and symptoms of the diseases. Students need a high degree of supervisión.

2. The first clinical practices stage

Intermediate students begin their practices and theoretical knowledge is transformed into clinical knowledge. They identified key symptoms and choosed professional tools to verified them but they still need support and supervision to develop a plan of action, flexibly apply their knowledge in their problem-solving strategies, and draw accurate conclusions.

3. The increasing experience stage

Competent students do most of their work independently, seeking support only to solve complex situations, identify and integrate the main aspects to generate logical conclusions.

The cumulative nature of CDR learning

- a) Competence in CDR improves with increasing knowledge
- b) Competence in CDR improves with increasing experience
 - a) the knowledge and skills acquired can be transferred to be used in different clinical situations with the accumulation of experience.
- c) Competence in CDR increases by deepening and reorganizing this knowledge with accumulated clinical experience

CDR Training Procedures in SLP

The most used training procedure is Case Study from different approaches

- **Virtually Systematized Simulation Experiences**
 - Systematized Problem Solving Tasks

The use of virtual simulated cases in teaching CDR for SLP students

Different simulation tools have been used

- a) Actors trained to represent a patient or a set of symptoms (Hill, Davidson, & Theodoros, 2010)
- b) Real patients simulated virtually with 3D figures or avatars as in the program PATSy, (Cox, 2011; <http://www.patsy.ac.uk>)
- c) Computer simulations of real patients designed to solve a real clinical problem as in the case of SimuCase (<https://www.simucase.com/speech-pathology>)

Advantages of using virtual clinical cases for teaching CDR to SLP students

1. Student's training task does not involve any discomfort for a patient who does not physically exist.
2. Student may administer as many tests and questionnaires as s/he decided in order to avoid fatigue for him and the patient.
3. Student through feedback can check if his/her choices have been the most suitable for:
 1. their hypotheses
 2. the selected tests
 3. the results obtained
 4. all of them matching each other

CDR training procedures in SLP

1. A core competency in SLP students is CDR
 - CDR learning included a set of cognitive processes of progressive and cumulative nature.
2. The most used training procedures is case study from different approaches
 - Virtually Systematized Simulation Experiences
 - Systematized Problem Solving Tasks
 - **Language Assessment Training System (LATS)**

Language Assessment Training System (LATS)

- An active learning tool in a *b-learning* context for training CDR, complementary to traditional methods.
- LATS is designed
 - To parallel the stages of CDR and to differentiate student performance profiles at different stages of the CDR process.
 - To provide feedback on demand and to provide tutorials in the different stages of the CDR process.
 - To allow the student detects his/her gaps in knowledge and critically reflect on his/her decisions targeting a clinical judgment.
- LATS is based on the '*Behavioural Decision Theory*'
 - LATS is based on a standard or criterion against which to compare student's performance following the principle of utility.
- LATS use virtual cases based on real cases.
- LATS provide cumulative experiences for learning.

Our apologies

It has not been possible to show original results showing the use of LATS by 3rd and 4th year speech and language therapy students at the university of Málaga due to the exceptional circumstances caused by COVID-19.

As an alternative solution, we show a summary of two previous experiences carried out by the authors and that have already been published.

ESTUDIO 1

60 4th year Speech and Language Therapy students participated in 3 virtual clinical cases using the LATS on 2 occasions with a 15 weeks gap between the first and second assessment moment.

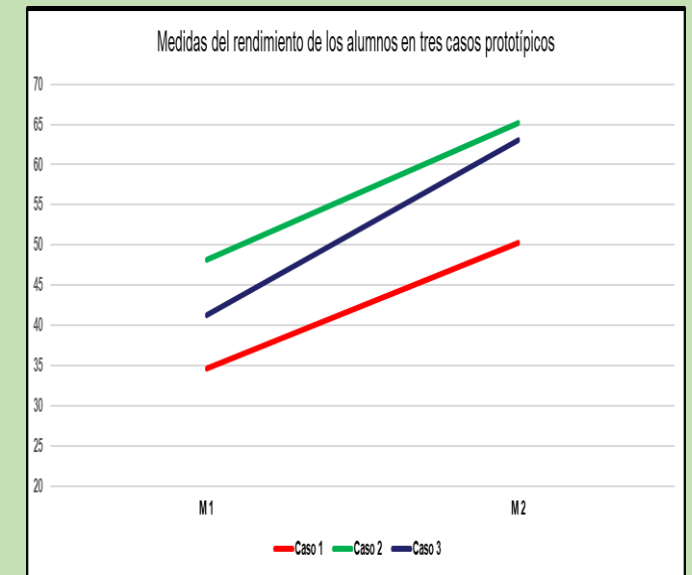


Calleja-Reina, Luque-Liñán, & Rodríguez-Santos (2018)

ESTUDIO 1

The results indicated

1. A progress in diagnostic skills.
2. Differences were found by case, showing that some cases are more difficult than others.
3. However, no differences were observed in the performance's progression that the students make when evaluating the three cases.
 - a) Students improve their performance using LATS in both moments of assessment.
 - b) Students improve their performance using LATS in the three cases assessed.



ESTUDIO 2

The authors delve into the difficulties with CDR of Speech and Language Therapy students using LATS tool.

- The aim was to identify the influence of each phase of CDR on final performance.
- Students from 3rd year of Speech and Language Therapy (n=18) participated and solved two LATS cases, of similar difficulty, in three attempts each without teacher feedback.

Luque-Liñán ML, Rodríguez-Santos JM, Calleja-Reina M, & Ferrer J. (2019)



ESTUDIO 2

- The results showed the differential contribution of each phase in the final performance.
- These results show evidence that LATS tool
 - allows the identification of the performance profile of each student when solving a case by indicating their strengths and weaknesses.
 - allows the personalization of the CDR training which is a central competence in Speech and Language Therapy training

Correlaciones Caso 2 (36). Rho de Spearman			
	Historia Clínica	Hipótesis	Pruebas / tests
Punt. Global	0,059	,593**	,730**
Historia Clínica		0,023	-0,123
Hipótesis			,421*
Pruebas / tests			



Final conclusion

1. LATS tool provides an improvement in CDR in Speech and Language Pathologist students from the third and fourth year.
 - This improvement can be considered the joint result of the work carried out by academic training and training in the specific skills promoted by the LATS tool.
2. This tool is used in the context of the intended b-learning approach.
3. It is considered that the right time to take advantage of the tool's potential is precisely during the fourth grade,
 - this is the moment when they have a solid conceptual basis to face clinical practice with progressively decreasing supervision.
 - Students are already in a position to enter the world of work and they possess the necessary clinical competencies that will allow them to cope, with professional guarantees, the diverse challenges to deal with the needs of their patients.



Thank you for your attention

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