

THEORETICAL ARTICLE/ESSAY

Research Initiation Rotations: Research initiation Program for undergraduate students


Rotações de Iniciação à Investigação: Programa de iniciação à investigação para estudantes de licenciatura

Rotaciones de iniciación a la investigación: Programa de iniciación a la investigación para estudiantes de grado


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Abstract

Background: Research Initiation Rotations (RIRs) fall under the Development Strategic Axis for Researchers' Training of the Health Sciences Research Unit: Nursing as part of the Young Researcher Window opportunities. Undergraduate nursing students volunteer to integrate research teams that develop activities linking teaching and research.

Objective: To analyze the results of the five editions of the RIR Program involving undergraduate nursing students (2014/2015 to 2018/2019).

Main topics under analysis: Thirty-two research projects involved 202 RIRs, 133 of which were successfully completed. In addition to the skills acquired as part of the research project teams, students attended nine training activities that were specifically designed for them.

Conclusion: Successfully completed RIRs are included in the diploma supplement. Despite the limited time available due to curriculum demands, students have rated this experience as very positive. The integration of this program into the curriculum is a step to be taken in the future.

Keywords: research initiation; nursing students; education; nursing

Resumo

Enquadramento: As Rotações de Iniciação à Investigação (RII) enquadram-se no Eixo Estratégico de Desenvolvimento para a Formação de Investigadores da Unidade de Investigação em Ciências da Saúde: Enfermagem, no contexto das oportunidades da Janela do Jovem Investigador. Os estudantes do Curso de Licenciatura em Enfermagem (CLE) voluntariamente disponibilizam-se para desenvolver atividades de ligação do ensino à investigação integrando equipas de investigação.

Objetivo: Analisar os resultados das cinco edições do Programa RII, envolvendo os estudantes do CLE (2014/2015-2018/2019).

Principais tópicos em análise: Trinta e dois projetos de investigação acolheram 202 RII, das quais 133 foram concluídas com êxito. Para além das competências adquiridas em contexto de integração nas equipas dos projetos de investigação, os estudantes frequentaram nove atividades de formação promovidas para eles.

Conclusão: As RII concluídas com sucesso são registadas no suplemento ao diploma. Apesar da limitada disponibilidade de tempo dos estudantes devido à exigência do plano curricular, estes têm avaliado esta experiência como muito positiva. A integração deste programa no plano curricular é um passo a promover no futuro.

Palavras-chave: iniciação à investigação; estudantes de enfermagem; educação; enfermagem

Resumen

Marco contextual: Las Rotaciones de Iniciación a la Investigación (RII) forman parte del Eje Estratégico de Desarrollo para la Formación de Investigadores de la Unidad de Investigación en Ciencias de la Salud: Enfermería, en el contexto de las oportunidades de la Ventana del Joven Investigador. Los estudiantes del Grado en Enfermería (CLE, en portugués) se ponen voluntariamente a disposición para desarrollar actividades que vinculen la docencia con la investigación, al formar parte de equipos de investigación.

Objetivo: Analizar los resultados de las cinco ediciones del programa RII, con la participación de estudiantes del CLE (2014/2015-2018/2019).

Principales temas en análisis: Treinta y dos proyectos de investigación acogieron 202 RII, de las cuales 133 se completaron satisfactoriamente. Además de las competencias adquiridas en el marco de la integración en los equipos de los proyectos de investigación, los estudiantes asistieron a nueve actividades de formación promovidas para ellos.

Conclusión: Las RII concluidas satisfactoriamente se registran en el suplemento al título. A pesar de la escasa disponibilidad de tiempo de los estudiantes debido a las exigencias del plan curricular, han valorado esta experiencia como muy positiva. La integración de este programa en el plan curricular es un paso que se debe promover en el futuro.

Palabras clave: iniciación a la investigación; estudiantes de enfermería; educación; enfermería

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Received: 02.02.21

Accepted 03.08.21



How to cite this article: Cardoso, M. L., Louçano, C. C., Cardoso, D. F., Silva, R. C., & Rodrigues, M. A. (2022). Research Initiation Rotations: Research initiation program for undergraduate students. *Revista de Enfermagem Referência*, 6(1), e21021. <https://doi.org/10.12707/RV21021>



Introduction

Research Initiation Rotations (RIRs) are an annual program promoted by the Health Sciences Research Unit: Nursing (UICISA: E). Its main objective is to link teaching and research, particularly regarding the contact of students of the Bachelor of Science in Nursing (*Curso de Licenciatura em Enfermagem*, CLE) with research and innovation activities since the first years of their academic studies. UICISA: E is a Portuguese research unit based at the Nursing School of Coimbra (*Escola Superior de Enfermagem de Coimbra*, ESEnfC) that develops research in the field of Nursing and Allied Health Sciences. It is assessed, accredited, and funded by the Portuguese Foundation for Science and Technology (FCT) since 2004.

On the path of modern nursing research, UICISA: E has its own organizational model for managing Research and Development R&D activities: the Cross-Cutting Model (CCM) of UICISA: E. “The CCM is based on three pillars: the team’s strength and merit; the focus of the research projects on priority topics; and the intensification of R&D activities through the intersection of the eight EED [Development Strategic Axes]” (Rodrigues, 2018, p. 5). The Development Strategic Axes (DSAs) consist of the “cross-cutting combination of specific measures, techniques, and specialized resources which support the team during the implementation of its projects and R&D activities” (Rodrigues, 2018, p. 7). UICISA: E has eight DSAs: Researchers’ Training; Synthesis and Implementation of Science; Experimental and Applied Research in Health Care Technologies; Publication and Dissemination of Scientific Knowledge; Ethics; Extension and Society Engagement; National and International Collaboration; and Optimization of the UICISA: E CCM.

The DSA for Researchers’ Training aims to promote researchers’ skills in an integrated chain system, from research initiation to advanced research. Within the scope of this DSA, activities are carried out for students undergoing basic and advanced research training. The RIR program is part of this DSA and targets ESEnfC undergraduate nursing students.

In order to strengthen the link between undergraduate students and research, UICISA: E has a webpage called Young Researcher Window (*Janela do Jovem Investigador*, JJI) that was created with and for CLE students. Thus, through the JJI, students have the opportunity to voluntarily learn more about the dynamics of UICISA: E, participate in the RIRs, and undergo training for the development of nursing research skills (ESEnfC, 2020). This information is available on the ESEnfC webpage, under the tab Research & Innovation, menu DSA Researchers’ Training, and section Research Initiation: <https://www.esenfc.pt/en/page/100004198/479>.

The aforementioned initiatives to link teaching and research from the early years of higher education allow students to understand the importance of research for the development of the nursing profession and the quality of patient care. Hall et al. (2019) corroborate this statement by reporting that an experiential learning activity in nursing research allowed students to not only increase their understanding of how research is conducted, but also to recognize its importance to disciplinary development. In 2014, Warkentin et al. had already argued that it is necessary to create opportunities for exposure to research to foster students’ enthusiasm for research and allow them to understand its nature and impact on the various dimensions of care.

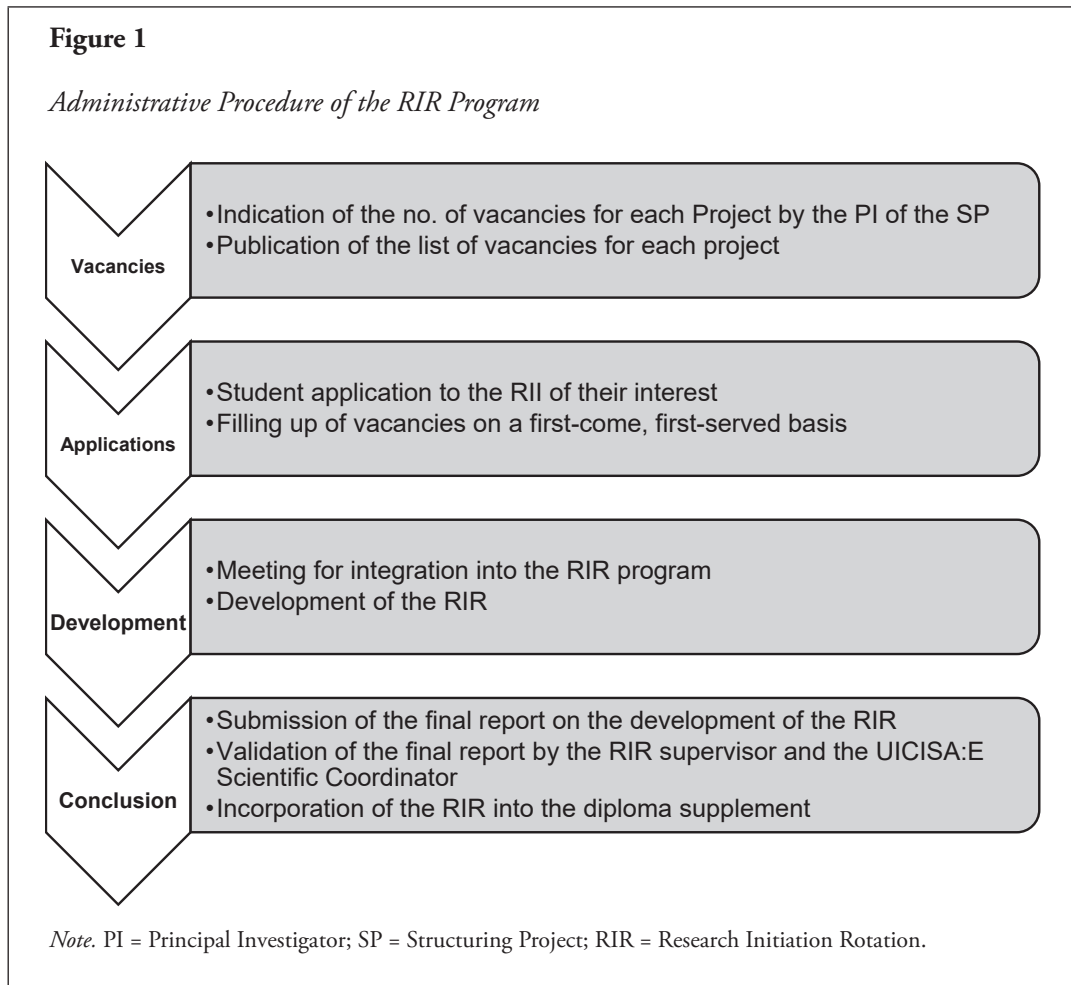
In Portugal, the Education System Framework Law highlights the link between teaching and research by including the following objective of higher education: “To stimulate cultural creation and the development of the scientific and entrepreneurial spirit and reflective thinking” (Law no. 46/1986 of the Assembly of the Republic, October 14, Art. 11, Point 2, Subparagraph a). Concerning the institutional context, the ESEnfC Strategic Plan for 2014-2018 includes the action “to intensify the link between teaching and research, transferring research results to the curricula and involving teachers and students in joint research activities (implementation of the Young Researcher Window)” in the operational objective “To promote researchers’ training throughout the entire chain, from initiation to advanced research, in cooperation with national and foreign universities” of strategic objective number two “To develop a scientific community of excellence” (ESEnfC, 2014, p. 31).

In view of the above, below are the results of five editions of the RIR program (2014-2019) that is part of the JJI, in which CLE students were involved.

Development

Opening of vacancies and applications to the RIR Program

In 2014, the RIR regulation was created and approved by the ESEnfC President and the Technical-Scientific Council (UICISA: E, ESEnfC, 2014). This regulation was operationalized in an administrative procedure that was in force between 2014 and 2019 (Figure 1). In general, this process involved several agents: the UICISA:E scientific coordinator and staff, staff of the Technical-Scientific Council, students, and researchers. It had several phases, including the assessment of the number of vacancies, the applications, the development of the RIR, and the incorporation into the diploma supplement. This process took place during one academic year.



Five editions of the RIR Program

Throughout the five editions of the RIR program, CLE students have constantly sought new research experiences as part of research projects in their areas of interest. The interconnection between the structuring project (SP) and the scientific-pedagogical areas of the CLE allows students to be involved in research activities. Consequently, students acquire knowledge and skills to make evidence-informed clinical decisions and participate in future research projects.

Between the 2014/2015 academic year and the 2018/2019 academic year, 32 SPs/Associated Studies/Funded Projects/Axes opened vacancies to integrate CLE students and 27 researchers supervised RIR students. Students participated in 202 RIRs, of which 133 RIRs were successfully completed (Table 1). Concerning the 69 RIRs that

were not completed, the number of planned hours was not met in 51 RIRs and the research pathway did start or end in the remaining 18 RIRs. Of the 116 students who completed RIRs, 101 participated in one edition of the program, 13 in two editions, and two in three editions. Of the 133 successfully completed rotations, 56% were completed by 3rd-year students, 25% by 4th-year students, 18% by 2nd-year students, and 1% by 1st-year students of the undergraduate nursing degree.

According to Table 1, over the five editions, the number of SPs that opened vacancies ranged from 13 to 23; the number of researchers involved in supervision ranged from 12 to 20; the number of completed RIRs ranged from 17 to 39; and the completion rate showed an ever-increasing trend, from 42.5% in the 1st edition to 95.12% in the 5th edition (Table 1).

Table 1*Data about the Research Initiation Rotation Program*

	2014/2015 (1 st edition)	2015/2016 (2 nd edition)	2016/2017 (3 rd edition)	2017/2018 (4 th edition)	2018/2019 (5 th edition)
SPs that opened vacancies	13	18	22	23	20
Researchers involved in supervision	12	15	20	19	16
Registrations	40	37	54	30	41
RIRs completed	17	18	36	23	39
Completion rate	42.5%	48.65%	66.67%	76.67%	95.12%

Throughout the RIR, students developed a set of research initiation activities as part of their research projects. Given that there are several different activities, we put forward

a set of objectives with examples of activities done collaboratively and with the supervisor's guidance. (Table 2).

Table 2*Research initiation activities carried out by RIR students*

Objectives	Activities carried out in collaboration with and under the guidance of a supervisor
To become integrated into the dynamics of UICISA:E/project	Reading documents and/or analyzing the web page to learn more about the organization of UICISA: E or the Development Strategic Axes
	Reading documents and/or analyzing the web page to learn more about important concepts related to the project in which the RIR takes place
To conduct literature reviews/systematic reviews	Database search
	Reading and analyzing scientific articles
To collect and process data	Questionnaire development
	Data collection
	Creation of a database or entry of data into a database
	Interview transcription
To collaborate in the dissemination of scientific knowledge	Data processing or analysis
	Submission of abstract for presentation at a scientific event
	Presentation of a paper at a scientific event
To participate in a scientific event	Writing a scientific article
	Preparation of the list of references according to the APA format
	Participation in the UICISA:E International Researchers' Training Seminar
To participate in training sessions to learn how to work with support software for research development	Participation in sessions/workshops on different topics
	Participation in lectures, conferences, meetings
To perform procedural tasks inherent to the RIR	Participation in training sessions on the reference management software
	Participation in training sessions on the data analysis software
	Implementation of the RIR's activity plan
To carry out other activities	Organization of tasks for the RIR
	Elaboration of the RIR's final report
	Development of other project activities that are not included in the previous objectives

Students carried out several activities, including data processing or analysis (84 students); reading of docu-

ments and/or analysis of the web page to learn more about important concepts related to the project in which

the RIR takes place (75 students); creation of databases, entry of data into databases, or transcription of interviews (67 students); preparation of literature reviews/systematic reviews (64 students); other project activities not included in the previous objectives (61 students); participation in training sessions or workshops on different topics (53 students); database search (51 students).

In the five editions, besides the research initiation activities developed as part of a research project team, the following workshops were specifically organized for research initiation students: *Glossariando* (2014/2015); *Bases de dados à Lupa* (2014/2015); *Comunicar Ciência* (2014/2015); *Surf SPSS for beginners* (2016/2017; 2017/2018; 2018/2019); *SR Alembic* (2016/2017; 2017/2018; 2018/2019). There were other activities planned for all researchers and open to RIR students, such as seminars, workshops, lectures, presentations, among others, which took place at UICISA: E. UICISA: E also offers students the possibility to make observations and comments about their RIR. Below are some excerpts taken from the reports. One student:

regrets not having done more rotations in previous years and believes that this rotation contributed to the consolidation of her path and the acquisition of knowledge because she was able to redirect her reasoning and critical spirit to her action and performance, contact with a new reality, acquire and enhance knowledge; it offered her learning experiences that will certainly help her in the future, both personally and professionally. (Excerpt taken from the report of a 4th-year CLE student undergoing a RIR in the 2016/2017 edition)

Another student mentioned that:

participating in the Research Initiation Rotation was a valuable input to my training as a nursing student because it allowed me to develop several research skills, namely searching certified databases, writing a scientific article, and writing using technical and objective language. (Excerpt taken from the report of a 2nd-year CLE student undergoing a RIR in the 2018/2019 edition)

A 3rd-year CLE student who participated in the 2014/2015 edition of the RIR program emphasized: “the challenging and relaxed environment in the Research Unit, although the sense of responsibility and mutual support is always present, which is also important for our personal development”.

This student also mentioned:

Experience with a very positive final balance; it was a useful and well-organized initiative. The opportunity to come into close contact with the reality of research under the supervision of a teacher/researcher provides unique and meaningful learning experiences because we receive all the attention to clarify doubts or guide the work. It proved to be important for better assimilation of the subjects taught in the course unit of Research because we had a practical component in which we could grasp the usefulness of each learning experience. (Excerpt taken from the report of a 3rd-year CLE student undergoing a RIR in the 2014/2015 edition)

These students' comments reflect, on the one hand, the collaborative and mutually supportive environment at UICISA: E and, on the other hand, students' perception of the value and applicability of research in nursing.

These positive comments align with the international scientific evidence. In an integrative review about nursing students' attitudes toward research, Ross and Burrell (2019) concluded that factors such as taking a research course, having an interest in a particular area of nursing research, application of research knowledge, or having prior research experience were associated with an improvement in undergraduate students' attitudes toward nursing research (Ross & Burrell, 2019).

Moreover, Warkentin et al. (2014) analyzed the experiences of four undergraduate nursing students who were enthusiastic about research and concluded that students found that collaboration and support were necessary factors to generate and maintain enthusiasm for research. Collaboration implies working alongside researchers, collaborators, and other students in the research processes. Concerning support, students identified, for example, training sessions in research programs. Collaboration and support opportunities served to increase students' confidence and practical skills, resulting in them realizing their potential as researchers and, subsequently, their ability to pursue their studies (Warkentin et al., 2014).

Concerning the RIR program of UICISA: E, we take on the challenge to continue promoting young researchers' training and monitor, analyze, and study their experiences to continuously improve this program, including its pedagogical aspects. However, it should be noted that some international studies have reported positive aspects related to the implementation of programs aimed at the participation of nursing students in research activities. Reutter et al. (2010) tested a research apprenticeship model in nursing students at a Canadian university. The authors concluded that students perceived an enhancement in their research skills, an appreciation of the processes and outcomes of nursing research, and an increase in their confidence to pursue their studies. Similarly, Burkhart (2015) described the development of a nursing research internship program and found that students who participate in research activities develop their research skills, gain an insight into the value of research for evidence-based nursing practice, learn to disseminate results through publications or presentations, and many of them pursue their academic studies while being involved in research activities. This ongoing involvement in research is visible in the RIR program of UICISA: E through the participation of former RIR students in research grants within the scope of funded projects.

Conclusion

The RIR program is promoted by UICISA: E to increase the link between research and teaching.

The RIR program is important for CLE students' training due to the contact with projects and activities that allow for the development of nursing research skills.

Throughout five editions, 133 RIRs were successfully

completed and included in diploma supplements. Despite students' demanding curriculum, namely in terms of workload, this experience was assessed as very positive. The integration of this program into CLE curricula will be a step to be taken in the future for a more modern nursing. Considering the continuous demand for projects by CLE students and the integration of some students in more than one edition of the RIR program, we conclude that this is an innovative initiative of this nursing research unit.

Acknowledgements

The authors would like to acknowledge the support of the Health Sciences Research Unit: Nursing (UICISA: E), based at the Nursing School of Coimbra (ESENFC) and funded by the Foundation for Science and Technology (FCT).

The authors would like to thank Professor João Luís Alves Apóstolo for his guidance in the development of this article.

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References

- Burkhart, P., & Hall, L. (2015). Developing the next generation of nurse scientists. *Nurse Educator*, 40(3), 160-162. <https://doi.org/10.1097/NNE.0000000000000121>
- Escola Superior de Enfermagem de Coimbra. (2020). *Unidade de Investigação em Ciências da Saúde: Enfermagem: Desde 2002*. <https://www.esenfc.pt/pt/page/100004069/303>
- Escola Superior de Enfermagem de Coimbra. (2014). *Plano estratégico 2014-2018*. https://web.esenfc.pt/-pa/ff20d0ca9fe962880d71d-54cfacd0bc4/Plano_Estrategico_2014-2018.pdf
- Hall, C., Skelly, C., Risher, C., & Pagano, M. (2019). Student perceptions of nursing research following an experiential learning activity. *Journal of Education and Practice*, 10(18), 11-15. <https://doi.org/10.7176/JEP>
- Lei n.º 46/1986 da Assembleia da República. (1986). Diário da República: I série, nº 237. https://dre.pt/web/guest/legislacao-consolidada/-/lc/34444975/view?p_p_state=maximized
- Reutter, L., Paul, P., Sales, A., Jerke, H., Lee, A., McColl, M., Stafford, E., & Visram, A. (2010). Incorporating a research apprenticeship model in a Canadian nursing honors program. *Nurse Education Today*, 30(6), 562–567. <https://doi.org/10.1016/j.nedt.2009.12.001>
- Rodrigues, M. (2018). Modelo cross-cutting para gestão de atividades I&D e inovação: No caminho da moderna investigação em enfermagem. *Revista de Enfermagem Referência*, 4(18), 141-154. <https://doi.org/10.12707/RIV18000>
- Ross, J. G., & Burrell, S. A. (2019). Nursing students' attitudes toward research: An integrative review. *Nurse Education Today*, 82, 79–87. <https://doi.org/10.1016/j.nedt.2019.08.006>
- Unidade de Investigação em Ciências da Saúde: Enfermagem, Escola Superior de Enfermagem de Coimbra. (2014). *Regulamento das Rotações de Iniciação à Investigação*.
- Warkentin, K., Popik, K., Usick, R., & Farley, T (2014). Fostering enthusiasm for research: Insights of undergraduate nursing students. *Journal of Nursing Education and Practice*, 4(5), 23-28. <http://dx.doi.org/10.5430/jnep.v4n5p23>