



Universiteit
Leiden
The Netherlands

Design, implementation and evaluation of transnational collaborative programmes in astronomy education and public outreach

Rodrigues Dos Santos Russ, P.M.

Citation

Rodrigues Dos Santos Russ, P. M. (2015, November 10). *Design, implementation and evaluation of transnational collaborative programmes in astronomy education and public outreach*. Retrieved from <https://hdl.handle.net/1887/36593>

Version: Not Applicable (or Unknown)

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/36593>

Note: To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/36593> holds various files of this Leiden University dissertation.

Author: Rodrigues dos Santos Russo, Pedro Miguel

Title: Design, implementation and evaluation of transnational collaborative programmes in astronomy education and public outreach

Issue Date: 2015-11-10

Design, Implementation and Evaluation of Transnational Collaborative Programmes in Astronomy Education and Public Outreach

Cover image: *Universe Awareness Activity in Zielona Góra, Poland (21/9/2012)* Credit: *Mariusz Słonina/UNAWE Poland/R. Monterde*

Design, Implementation and Evaluation of Transnational Collaborative Programmes in Astronomy Education and Public Outreach

Proefschrift

ter verkrijging van
de graad van Doctor aan de Universiteit Leiden,
op gezag van Rector Magnificus prof. mr. C.J.J.M. Stolker,
volgens besluit van het College voor Promoties
te verdedigen op dinsdag 10 november 2015
klokke 11.15 uur

door

Pedro Miguel Rodrigues dos Santos Russo

geboren te Figueira de Castelo Rodrigo, Portugal
in 1977

Promotiecommissie

Promotors:

Prof. dr. Jos van den Broek (Universiteit Leiden)

Prof. dr. George Miley (Universiteit Leiden)

Overige leden:

Prof. dr. Peter Barthel (Universiteit Groningen)

Prof. dr. Hidehiko Agata (National Astronomical Observatory of Japan)

Dr. Jarle Brinchmann (Universiteit Leiden)

Prof. dr. Huub Röttgering (Universiteit Leiden)

To my parents, brother, grandparents and Julia
for their unlimited support and continuous encouragement.

Design, Implementation and Evaluation of Transnational Collaborative Programmes in Astronomy Education and Public Outreach

Table of Contents

Part I. Introduction.....	13
Introduction.....	15
Science Communication and Public Engagement	15
Astronomy and Society	20
This Thesis.....	21
References	24
Part II. Innovation in Global Science Education and Public Outreach Program- mes.....	29
II.1. The International Year of Astronomy 2009 as a Massive Science Communi- cation Project.....	31
1. Introduction	33
2. IYA2009 – Case Study of an International Year of Science	36
3. Discussion	47
4. IYA2009 Legacy	49
5. Conclusions.....	50
Referen- ces.....	51
II.2. Universe Awareness as a Transnational Collaborative Programme in Astro- nomy Education.....	57
1. Introduction.....	59
2. Design of the EU-UNAWE Programme	63
3. Implementation of the EU-UNAWE Programme	70
Part III. Innovations in Astronomy Education Resources	97
III.1. Peer-review Platform for Astronomy Education Activities	99
1. Introduction.....	101
2. Astronomy Education Repositories	101
3. astroEDU Technical Implementation	107
4. Conclusions & Future Work.....	108
5. References.....	109
III.2 Design, Development, and Impact of Physical Resources for Science Educa- tion.....	113
1. Introduction	115
2. Educational Kits in Astronomy.....	115
3. Design of a Global Astronomy Educational Kit	116
4. Production and Distribution.....	122
5. Crowdfunding campaign.....	126
Evaluation & Discussion.....	129
References.....	130

Part IV. Impact of Astronomy Education and Public Outreach on Astronomical Research	133
---	-----

IV.1. A Survey of Astronomical Research: A Baseline for Astronomical Development	135
1. Introduction	137
2. Methods	138
3. Results	139
4. Discussion and Conclusion	145
5. Acknowledgements	146
Appendix A: World Countries	147
Appendix B: Least Developed Countries	147
Notes	148
References	148

IV.2 The Influence of Social Movements on Space Astronomy Policy	151
1. Introduction.....	153
2. Hubble Space Telescope.....	153
3. James Webb Space Telescope	154
4. New Trends: ISEE-3 and Crowdfunding as a Public Support Tool	155
5. Looking Ahead: Emerging Cases	157
6. Conclusions	157
Acknowledgements.....	157
References.....	158

Part V. Closing Remarks.....	163
1. Summary of Results.....	165
2. Changing Aspects of Science Communication.....	165
References.....	167

Nederlandse samenvatting.....	169
Curriculum Vitae	179
Acknowledgements	183

