



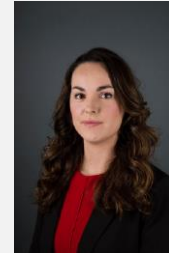
ASSESSING OUTCOMES OF RCR EDUCATION

WCRI conference, 4th June 2024

Dr. Miriam van Loon, Prof. Mariëtte van den Hoven

ASSESSING THE OUTCOMES OF RESPONSIBLE CONDUCT OF RESEARCH EDUCATION: A QUALITATIVE CONTENT ANALYSIS OF VALIDATED MEASURES

- Dr. Miriam van Loon



- Dr. Johannes Katsarov



- Dr. Daniel Crean



- Prof dr. Mariëtte van den Hoven



- Dr. Natalie Evans



RCR EDUCATION



- RCR, RI, RE – topics combined in trainings, broad approach
- Influence **aspects of decision making in research**, from motivations to actions (Goddiksen et al., 2022; Watts et al., 2017A; Kalichman & Plemmons &, 2006).
- Different approaches and assumptions underlying RCR education, eg
 - Focus on improving knowledge and awareness of **rules**
 - Focus on building professional integrity / **virtues**/ values

- Who teaches in RCR?
- Who evaluates the learning outcomes?
- Who uses a validated questionnaire?



EVALUATION OF RCR EDUCATION



- How do we know if learning outcomes are improved?
- Need for **appropriate measureable indicators**
- Aligning assumptions, learning objectives and evaluation approaches of training
- Improve training
- **Aim: provide an overview and compare existing measures**
 - Support educators to make decisions on development & assessment of RCR courses
 - How is RCR currently understood?

RESEARCH QUESTIONS

1. What measures, specific for the research context, are used for the evaluation of diverse learning outcomes of RCR courses?
2. What is the 1) content, 2) structure, and 3) learning outcomes of available measures and their items?
3. Are available measures validated? If so, how?

Building on Katsarov et al.'s (2021) systematic review & meta-analysis of studies evaluating effectiveness of RCR courses

Assessing the outcomes of responsible conduct of research education: A qualitative content analysis of validated measures



Public registration ▾

Updates ▾



🏠 Overview

📄 Metadata

📁 Files

📁 Resources

📖 Wiki

🔧 Components 0

🔗 Links 0

📊 Analytics

💬 Comments 0

Summary



Provide a narrative summary of what is contained in this registration or how it differs from prior registrations. If this project contains documents for a preregistration, please note that here.

Evaluation is an essential step in the continued development of courses (Cahapy, 2021; Smidt et al., 2009). It is, however, not always clear for educators which measurable indicators might be appropriate for the assessment of the outcomes of their courses. To support educators to better align the learning objectives and evaluation approaches of their training, both in terms of content, underlying teaching philosophies and assumptions, our goal is to establish an overview of existing measures. Concretely, we want to make the existing measures comparable for fellow researchers and educators, and make transparent, what can be measured via the measures, and how the measures are connected to different theoretical viewpoints.

This review supports all educators to make decisions about the development and assessment of RCR courses. Furthermore, the analysis will make apparent how the construct of RCR is currently understood and measured, which is important for the

Contributors

Miriam van Loon, Johannes Katsarov, Daniel Crean, Mariëtte vd Hoven, and Natalie Evans

Desc

The a
evalu
meas
impa

Regis

Open

Date

April .



RESEARCH PROTOCOL

- <https://osf.io/pzasv>

INCLUSION

Criterion	Inclusion	Exclusion
Language	English	Non-English reported studies
Time period	January 1990 to March 2023	Studies outside the time period
Dependent variable	Studies investigating learning outcomes of RCR courses through relevant tests, and studies that present or validate tests that have been tailored for the evaluation of RCR education	Tests and measures that do not specifically focus on the assessment of RCR-specific learning outcomes, e.g., general measures of moral development
Availability of the study	The full study must be available to consult via a journal or the internet	Unavailable and retracted studies
Availability of the test	The measure must be available or be made available to the researchers	Measures that were not published with related articles, and which were not made available to the researchers for review

ANALYSIS

- Qualitative content analysis
- Measures coded in MaxQDA, by MvL, NE, MvdH
- Combining deductive & inductive approaches
 - Learning outcomes (Katsarov et al., 2021)
 - The RCR constructs assessed using the frameworks:
 - European Code of Conduct for Research Integrity (ESF-ALLEA 2017) – **Research integrity**
 - European Textbook on Ethics in Research (Hughes et al 2010) – **Research ethics**

LEARNING OUTCOMES

- **Katsarovs et al (2021)** learning outcomes framework, based on:
 - Learning outcomes in moral/ethical domain (Maasschalck & De Schrijver, 2015)
 - Abilities underlying moral agency (Tanner & Christen, 2014)
 - Learning objectives for RCR (Antes & Dubois, 2014)
 - Distinguish outcomes
- 1. **Behaviour:** actual or planned ethical behaviours
- 2. **Judgment:** engage in professional ethical decision-making, moral reasoning
- 3. **Sensitivity:** recognize ethical problems
- 4. **Attitude :** willingness to exercise research in a responsible manner
- 5. **Knowledge**

CONTENT ANALYSIS

Table 1. Frameworks used for deductive qualitative content analysis

Learning outcomes	Research Integrity	Research Ethics
<ol style="list-style-type: none">1. Knowledge2. Attitude3. Sensitivity4. Judgment5. Behavior	<ol style="list-style-type: none">1. Research Environment2. Training, Supervision and Mentoring3. Research Procedures4. Safeguards5. Data Practices and Management6. Collaborative Working7. Publication and Dissemination8. Reviewing, Evaluating and Editing	<ol style="list-style-type: none">1. Consent2. Vulnerable and non-competent subjects3. Privacy and confidentiality4. Balancing harms and benefits5. Justice considerations in research6. Societal implications of research7. Ethical issues in the new biotechnologies

PRELIMINARY RESULTS



	Name	Developers	
1	RE knowledge and attitudes toward RE education in Saudi Arabia	Al Madaney & Fässler, 2023	
2	TESSE 11.5	Borenstein et al., 2006	
3	Professional Decision making in Research (PDR) (based on EDM)	Antes et al., 2018	
4	Path 2 Integrity	Zollitsch et al., 2022	
5	DIT-2 Defining Issues Test	Rest & Narvarez 1998	
6	The Revised Responsible Conduct of Research Reasoning Test (rev-RCRRT)	Pan et al. (2022)	
7	REKASA	Taylor et al., 2013	
8	Assessing climate for RE in labs	Solomon et al., 2022	
9	SOLKA - Academic integrity in online learning for health science students	Chertok et al., 2013	
10	Literacy based Research integrity assessment framework	Chou & Lee, 2022	

INCLUDED VALIDATED MEASURES

	Name	Developers	
11	Values in Scientific Work (VSW)	English et al., 2018	
12	Responsible Conduct of Research Knowledge Test	Bioethics Research Center, 2020	
13	Students ethical awareness and conceptions of RE?	Löfstrom (2012)	
14	Culturally tailored RE curriculum?	Pearson et al., 2018	
15	Perceptions of authorship criteria	Hren et al., 2007	
16	The How I Think about Research (HIT-Res) test	Dubois et al., 2016	
17	Outcomes assessment of role play scenarios for teaching RCR	Seiler et al., 2011	
18	Reliability and validation of an attitude scale regarding responsible conduct in research	El Hafeez et al., 2022	

PRELIMINARY ANALYSIS RESULTS

- Wide variety in approaches to assessment of RCR education
- Learning outcomes; from knowledge to judgment
- Behaviour: plagiarism
- Types of questions: case analysis, open questions, closed questions multiple choice, yes/ no
- Evaluation of negative and positive aspects of RCR (qrps and motivations identifying misbehaviours, or reflecting on cases and how to behave responsibly)
- Insight in different creative teaching methods, such as role playing, theater play

RE KNOWLEDGE & ATTITUDES RE EDUCATION



..Consent
..Knowledge

..Informed consen

..Informed consen

..Informed consen

..Informed consen

..Informed consen

..Informed consen

..Informed consen

1. Basic and additional elements of informed consent:

If you conduct clinical research involving human subjects, which of the following elements should be part of the informed consent:

Items	Correct	Not correct	I Don't Know
1. A statement that the study involves research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. An explanation of the purposes of the research is not a part of the informed consent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. An explanation of the expected duration of the subject's participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. A description of the procedures to be followed, and identification of any procedures which are experimental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. A description of any reasonably foreseeable risks or discomforts to the subject	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. A description of any benefits to the subject or to others which may reasonably be expected from the research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. A disclosure of appropriate alternative procedures or courses of treatment, that might be advantageous to the subject	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. A statement describing to what extent records will be kept confidential, including a description of who may have access to research records	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. An explanation and description of any compensation and any medical			

PDR



.Protection of pr
.Sharing data wi

.Protecting privacy
.Judgement

.Protection of priv

.Train supervisees co

.Consulting the IRB

3.2 You recently agreed to share your dataset with two researchers who want to investigate questions that neither you nor Smith wants to pursue. One of your research assistants sends the dataset to the researchers. However, you later find out that the dataset contained the names and addresses of participants.

Consider the following options and select the two that best describe what you might do if you were really in the challenging situation:

-
-
-
-
-
-

THE REVISED RESPONSIBLE CONDUCT OF RESEARCH REASONING TEST (REV-RCRRT)

..Informed c
..Sensitivity

..Judgement
..Informed c

QS6. Scenario: Hannah is a teaching assistant (TA) for a general education course in a university, and she is also a master's student in electrical engineering. Hannah has prepared a psychological questionnaire as her year-end report and plans to distribute the questionnaires during the class in which she is a teaching assistant as a temporary approach. To avoid students casually filling of the questionnaire survey, which would impact the authenticity of the data, Hannah plans to conceal from the students the fact that this questionnaire is part of her research and instead present it as in-class work required by the instructor that students will be rewarded with a bonus for completing. (*Research Data Management: Human-Subject Protection [Informed Consent]*)

Question A: From a research ethics point of view, is Hannah's behavior appropriate?

Note: The deceptive strategies used in certain experiments (for example, to distinguish between an experimental group and control group, the subjects are led to believe that they were given injections of certain nutrients, which in fact were normal saline) are excluded from the scope of discussion of this question.

Question B: Please choose one of the four items that best supports your answer to *Question A*.

In order to execute scientific research, Hannah is permitted to conduct a questionnaire survey during her TA class and have students fill out the questionnaires using class time. She can even reward students for doing so, just like teachers would reward students for their active participation in sharing thoughts and opinions, which is indeed what Hannah has done.	Most university curriculum ethics committees explicitly state that teaching assistants are not permitted to participate in student grading. Thus, Hannah should not arbitrarily offer extra credits to student and/or use incentive credits to make a voluntary contribution for her; otherwise, she will be subject to punishment terms from the ethics committee.
In scientific research, in order to pursue data authenticity, telling white lies during surveys is sometimes necessary in order to effectively avoid the probability of having students casually fill in the questionnaire survey, and enhance the authenticity of the data collected.	Hannah should not distribute the questionnaires in the class where she serves as a teaching assistant. She should visit classes taught by other teaching assistants (TAs) and make clear that the survey is only for her research project, while the TA is not involved in any way. She then could perform the survey in the classes that are free from conflict of interests such that any possible controversial academic relations between the parties can be avoided, and without creating any top-down pressure on the students when asked by their teaching assistant to fill out the questionnaires. (<i>the best answer</i>)
The scientific community usually accepts this kind of deception because if the subjects were told the real purpose of the questionnaire, they might refuse to answer or just casually fill out the answers.	In scientific research, a questionnaire is a commonly used research method. Hannah should discuss this matter with the class instructor in advance. After gaining the instructor's consent, Hannah should also discuss with the instructor the details of extra credit and list them in the course outline before the questionnaires can be distributed.
Since the review of research ethics in the field of electrical engineering is relatively lenient, Hannah's behavior is appropriate and permissible. However, if the same behavior occurs in other fields like bioengineering or medical science, its appropriateness may be challenged when under ethics scrutiny. Hannah should be mindful of the differences between fields.	As a researcher, Hannah should uphold the principle of honesty. Even when the research design calls for deceptive items in advance, researchers should still reveal the deception to the subjects at the end of the survey and should not use wording such as "extra credit" or "required by instructor" to guide the students' behavior. Hannah's behavior was contrary to the above principle; therefore, it is not appropriate.
Other Reasons. Please specify:	Other Reasons. Please specify:

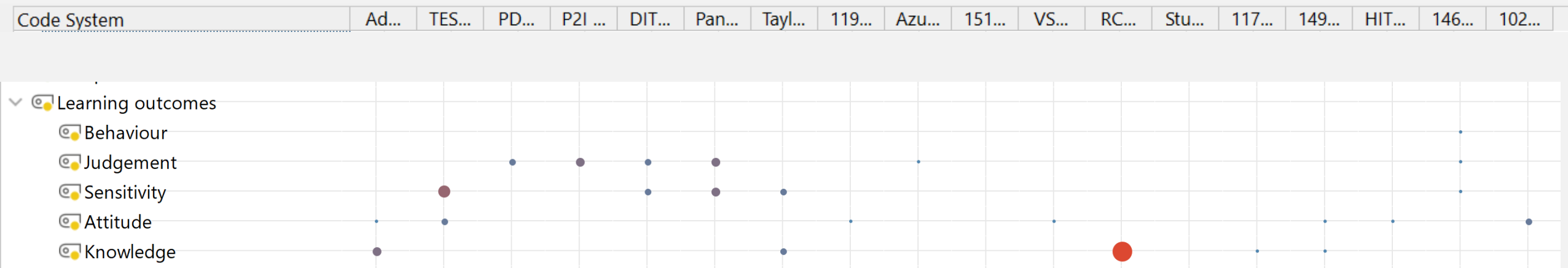
HIT-RES



- ..Institutional Review
- 2.3 Research Procedu
- 2.6 Collaborative Wc
- ..Animal ethics
- 2.6 Collaborative Wc
- ..Institutional Review
- 2.6 Collaborative Wc
- ..Withholding research
- 2.3 Research Procedu
- 3.1 Research miscon
- 2.1 Research Environ
- ..Animal ethics
- ..Institutional Review
- 3.1 Research miscon
- ..Consent

5. IRBs and IACUCs focus so much on rules and regulations they can make it impossible to do research. (AW)
6. The pressure to get grants almost forces people to take liberties with their data. (BO)
7. No matter what I do, someone will find a compliance problem in my research. (AW)
8. You cannot expect research collaborators to act with complete integrity. (AW)
9. The advancement of my science should have priority over the quality of life of a lab mouse. (SC)
10. It's not my fault if I lose my temper when others produce poor work. (BO)
11. I do not have time to deal with IRBs, IACUCs, and other oversight offices. (SC)
12. I have sometimes said something bad about a colleague. (AR)
13. Everyone drops data sometimes when they know it's leading to wrong results. (MM)
14. I know which corners I can cut to meet a deadline. (SC)
15. I have covered up some things that I have done at work. (AR)
16. My institution makes it too hard to disclose all conflicts of interest. (BO)
17. People who don't understand the realities of animal research are responsible for all of these strict animal care regulations. (BO)
18. It's annoying that institutional committees do not trust researchers to do their jobs right. (SC)
19. We can't be perfect--we just have to muddle our way through when it comes to research ethics. (AW)
20. Consent forms don't protect participants because no one reads them anyway. (AW)

PRELIMINARY RESULTS: LEARNING OUTCOMES



RI THEMES

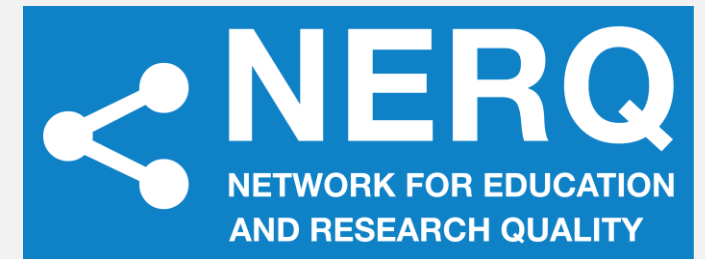
Code System	Ad...	TES...	PD...	P2I ...	DIT...	Pan...	Tayl...	119...	Azu...	151...	VS...	RC...	Stu...	117...	149...	HIT...	146...	102...
> 3.1 Dealing with violations and alle			•	•								•						
> 2.8 Reviewing, Evaluating and Editi			•									•						
> 2.7 Publication and Dissemination			•	•								•		•	•			
> 2.6 Collaborative Working	•	•	•								•	•					•	
> 2.5 Data Practices and Manageme			•	•							•	•						•
> 2.4 Safeguards																		
> 2.3 Research Procedures	•	•	•	•			•				•	•						•
> 2.2 Training, Supervision and Ment	•	•	•	•								•						•
> 2.1 Research Environment	•							•			•							•

NEXT STEPS

- Publish & present the review



- Develop with experts a measure including different learning outcomes, and a range of RI & RE topics
- NERQ special interest group **Research on Education**
- 13 september 10:00-11:30
- <https://www.linkedin.com/groups/12743594/>
- M.loon@amsterdamumc.nl



DISCUSSION

- (How) do you evaluate RCR education?
- Which (validated) measures are you familiar with?
- Should we include additional validated measures?

- Mixed methods evaluation

- What learning outcomes are most relevant?
- Should behaviour be assessed, and how? – what are core characteristics of RCR behaviours and how to evaluate those?



Funded by the European Union

Funded by the European Union, UK participants in Horizon Europe Project irecs are supported by UK Research and Innovation grant numbers 10055935 (University of Central Lancashire) and 10037820 (De Montfort University). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the Research Executive Agency or UKRI. Neither the European Union nor the granting authority nor UKRI can be held responsible for them.



<https://www.irecs.eu/>

REFERENCES

- ESF-ALLEA (2017). The European code of conduct for research integrity. Retrieved June 2018, from <http://www.allea.org/wp-content/uploads/2017/04/ALLEA-European-Code-of-Conduct-forResearch-Integrity-2017.pdf>. European Science Foundation and All European Academies.
- Goddixsen MP, Gjerris M. Teaching phronesis in a research integrity course. *FACETS*. 2022;7:139- 52.
- Hughes, J., Hunter, D., Sheehan, M., Wilkinson, S., & Wrigley, A. (2010). European textbook on ethics in research. Publications Office of the European Union.
- Kalichman, M. W., & Plemmons, D. K. (2007). Reported goals for responsible conduct of research courses. *Academic Medicine*, 82(9), 846-852
- Katsarov, J., Andorno, R., Krom, A., & van den Hoven, M. (2021). Effective Strategies for Research Integrity Training—a Meta-analysis. *Educational Psychology Review*, 1-21.
- Watts, L. L., Todd, E. M., Mulhearn, T. J., Medeiros, K. E., Mumford, M. D., & Connelly, S. (2017a). Qualitative evaluation methods in ethics education: A systematic review and analysis of best practices. *Accountability in Research*, 24(4), 225-242.