

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/25806> holds various files of this Leiden University dissertation.

Author: Dam, Michiel

Title: Making educational reforms practical for teachers : using a modular, success-oriented approach to make a context-based educational reform practical for implementation in Dutch biology education

Issue Date: 2014-05-21

MAKING EDUCATIONAL REFORMS PRACTICAL FOR TEACHERS

USING A MODULAR, SUCCESS-ORIENTED APPROACH TO MAKE A
CONTEXT-BASED EDUCATIONAL REFORM PRACTICAL FOR
IMPLEMENTATION IN DUTCH BIOLOGY EDUCATION

ICLON

ICLON, Leiden University Graduate School of Teaching

DUDOC

This research was supported by funding of Platform Beta Techniek via the DUDOC program that focused on linking research and practice in educational settings

Title: Making educational reforms practical for teachers: Using a modular, success-oriented approach to make a context-based educational reform practical for implementation in Dutch biology education

Titel: Onderwijsvernieuwingen praktisch bruikbaar maken voor docenten: Het gebruik van een modulaire en succesgerichte benadering om een concept-context onderwijsvernieuwing praktisch bruikbaar te maken voor implementatie in het Nederlandse biologieonderwijs

ICLON PhD Dissertation Series

Print: Mostert & van Onderen! Leiden

Cover design: Studio Ney / Bas Kleinhout

Lay-out: Studio Ney / Bas Kleinhout

ISBN/EAN: 978-94-90383-12-1

© 2014, Michiel Dam

All rights reserved. No part of this thesis may be reproduced, stored in retrieval systems, or transmitted in any form by any means, electronic, mechanical, photocopying, recording or otherwise without the prior written permission of the author.



MAKING EDUCATIONAL REFORMS PRACTICAL FOR TEACHERS

USING A MODULAR, SUCCESS-ORIENTED APPROACH TO MAKE A
CONTEXT-BASED EDUCATIONAL REFORM PRACTICAL FOR
IMPLEMENTATION IN DUTCH BIOLOGY EDUCATION

Proefschrift
ter verkrijging van
de graad van Doctor aan de Universiteit Leiden,
op gezag van Rector Magnificus prof. mr. dr. C.J.J.M. Stolker,
volgens besluit van het College voor Promoties
te verdedigen op woensdag 21 mei 2014
klokke 15.00 uur
door

**MICHIEL
DAM**

geboren te Gouda
in 1981

Promotiecommissie

Promotor

Prof. dr. J.H. van Driel

Copromotor

Dr. ir. F.J.J.M. Janssen

Overige leden

Prof. dr. W.J. Admiraal

Prof. dr. W.A.J.M. Kuiper, Universiteit Utrecht

Dr. A.K. Berry

Table of contents

- 1. General introduction** 1
- 1.2 Context of the study 3
- 1.3 Conceptual framework 4
 - 1.3.1 Context-based education 4
 - 1.3.2 Professional development in the context of educational reform 6
 - 1.3.3 Practicality 7
- 1.4 Research goal 10
- 1.5 Overview of the study 10

- 2. The construction and internal validation of a modular ID model** 15
- 2.1 Introduction 16
- 2.2 Theoretical framework 17
 - 2.2.1 The expansion of teachers' repertoire of instructional approaches 17
 - 2.2.2 The construction of an initial ID model 20
- 2.3 Methods 24
 - 2.3.1 Background of the Delphi method 24
 - 2.3.2 Selection of participants 25
 - 2.3.3 Procedure in the Delphi method 25
 - 2.3.4 Data analysis 27
- 2.4 Results 29
 - 2.4.1 Pilot 29
 - 2.4.2 Phase 1 32
 - 2.4.3 Phase 2 36
 - 2.4.4 Phase 3 38
- 2.5 Conclusion and discussion 38
- Appendix 2.1 40
- Appendix 2.2 42

3. Attention to intentions - how to stimulate strong intentions to change	45
3.1 Introduction	46
3.2 Theoretical framework	47
3.2.1 Building on earlier successful experiences	50
3.2.2 Using lesson segments to rearrange instructional approaches	51
3.4 Method	52
3.4.1 Selection of participants	52
3.4.2 Lesson segments	53
3.4.3 Context-based biology education	54
3.4.4 Procedure	55
3.4.5 Data gathering and analysis	56
3.6 Results	57
3.6.1 The case of Walter	60
3.6.2 The case of Ivy	62
3.7 Conclusions and implications	63
Appendix 3	66
4. Learning to design and enact context-based education	67
4.1 Introduction	68
4.2 Theoretical framework	69
4.2.1 Implementing educational reforms	69
4.2.2 Allow teachers to build on earlier successful experiences	71
4.2.3 Allow teachers to accomplish the proposed reform	72
4.2.4 Support teachers from a distance	72
4.3 Method	74
4.3.1 Participants	74
4.3.2 Operationalization of the reform	75
4.3.3 Procedure	76
4.3.4 Data collection and analysis	78
4.4 Results	80
4.4.1 Strength of intentions	80
4.4.2 Changes in teaching repertoires	80
4.5 Conclusion and discussion	86

5. Fostering teachers' professional development	91
5.1 Introduction	92
5.2 Theoretical framework	93
5.3 Method	98
5.3.1 Participants	98
5.3.2 The context-based reform proposal	99
5.3.3 PD program	99
5.3.4 Lesson segments	102
5.3.5 Frames used in this study	103
5.3.6 Data collection and analysis	104
5.4 Results	106
5.4.1 Case study Paula	106
5.4.2 The use of frames	107
5.5 Conclusions and implications	110
Appendix 5A	114
Appendix 5B	116
6. General conclusion and discussion	119
6.1 Aim and research questions	119
6.2 Summary of conclusions per study	120
6.3 General discussion	125
6.4 Limitations and recommendations	128
6.5 Implications	129
References	131
Summary	140
Nederlandse samenvatting	146
Scientific contributions	153
Curriculum Vitae	155
Dankwoord	156
ICLON PhD dissertation series	158

