



Annual Report 2016



July 2017

LIST OF CONTENTS

Summary

Preface

1. Structure research institute

- 1.1. Participating faculties
- 1.2. Research themes
- 1.3 Research programmes
- 1.4 Organisation
- 1.5 Organisational chart

2. Composition

- 2.1. Research staff
- 2.2. Financial input

3. Research Quality

- 3.1 Research output
- 3.2 Key publications
- 3.3 Indicators of esteem

4. Societal relevance

- 4.1 Overview
- 4.2 Indicators of esteem

5. Performance Indicators LEARN! per assessment dimension

6. Viability

- 6.1 SWOT research programmes

7. Earning capacity

8. Collaborations

- 8.1 National collaborations
- 8.2 International collaborations

9. Quality control

- 9.1 Data Storage
- 9.2 Quality of research

Appendix:

- A: list of researchers per programme

SUMMARY

LEARN! is a multidisciplinary institute that comprises both pedagogical, neuropsychological as well as applied educational studies. Its mission is to improve insight and knowledge concerning education in the broadest sense of the word, comprising formal and informal education, as well as upbringing. LEARN! focuses on the development of children, students and adults in the context of home, school and leisure activities. Research programmes focus on innovative teaching environments, learning and teaching strategies and on biological, psychosocial and cultural factors that promote talent development in a lifetime perspective. Many research projects are carried out in direct collaboration with societal partners (e.g. schools, universities of applied sciences, educational industry and others).

Important highlights in the development and organisation of the institute in 2016

1. LEARN! was evaluated by an outside committee of experts, and was found to deliver high-quality research with high societal relevance.
2. ERC Starting Grant (van Atteveldt)
3. Merger of the research programs of Brain & Learning and Social Cognition to the program of Educational Neuroscience under the leadership of Krabbendam
4. Start of the research program Personalized Learning, Differentiated Teaching, replacing Teachers & Teacher Education, under the leadership of Meeter
5. Amsterdam Center for Learning Analytics (ACLA) started within LEARN!
6. Expansion of LEARN! by group prof. J. van Saane (Faculty of Theology) and dr van Agtmael (VUmc)
7. SiG Educational Neuroscience meeting held in Amsterdam, sponsored by LEARN!

PREFACE

In 2016, LEARN! went through its periodical outside evaluation. This was the first such evaluation since its inception in 2009. A committee of international experts and national representatives of the field was formed. It visited LEARN! in June 2016, delivering its report at the end of the summer. It reached a favourable verdict, reporting that LEARN! research was of very high quality, was of very high societal relevance, and was highly viable. It also gave some policy suggestions to the board of LEARN!, notably to pursue a policy of increasing the size of LEARN!, and fostering more collaboration between the research programs. The management and board of LEARN! were very pleased with this outcome, and will follow through on the suggestions in 2017.

Two other developments altered the composition of LEARN! First, due to a decrease in size, two research programs were merged into one: Brain & Learning and Social Cognition together became the program of Educational Neuroscience, under the leadership of prof. Lydia Krabbendam. Moreover, the program Teacher and Teacher Education was changed to the program Personalized Learning, Differentiated Teaching to reflect an increase in size of the program, and the new focus of prof Martijn Meeter, who succeeded Jos Beishuizen in the chair of education science and as program lead. However, the work of prof Jos Beishuizen continues within the program, and both teachers and teacher education remains a focus.

Moreover, prof Joke van Saane (VU Theology) joined LEARN!, as did prof Gjalt de Graaf LEARN! as an associate member, contributing his research on organizational ethics within educational institutions. The group of Michiel van Agtmaal (VUmc, internal medicine) joined LEARN! in 2016, although the discussions on how this group will be placed within the institute are ongoing.

At the funding side, dr. Nienke van Atteveldt was awarded a highly competitive ERC Starting Grant. Moreover, to accommodate several grants received for work on learning analytics, the Amsterdam Center for Learning Analytics (ACLA) was started within LEARN! ACLA has fellows from many disciplines, and operates under the directorship of dr. Chris van Klaveren.

The societal advisory board that was formed in 2013 has met twice in 2016. The input of its members has been valuable for PI's and has confirmed that LEARN! succeeds in its mission to have not only academic, but also societal merit.

LEARN! remains a relatively small institute with a lean management structure. However, as shown by the outcome of the outside evaluation, it is also a healthy organisation of researchers with many qualities and inspiring new opportunities for collaboration with other groups at VU University.

1. STRUCTURE RESEARCH INSTITUTE

1.1. Participating faculties

In 2016 the following faculties participated in LEARN!:

- Faculty of Behavioural and Movement Sciences
- VUMC Institute for Teaching and Education
- Faculty of Social Sciences
- Faculty of Theology

1.2. Research Themes

Learners, their Needs and Interests

- The learning child and adolescent
- Personalizing education to the learner
- Brain mechanisms supporting learning
- Motivation and study success
- Reading and maths
- Executive functions, mindsets and metacognitive strategies

Families, Education and Society

- Upbringing and schooling
- Flourishing, ideals and identity
- Meaningful education and citizenship education
- Parent-school collaboration

Teachers, Teaching and the Professional World of Teachers

- The role of teachers in knowledge acquisition and development
- Differentiated teaching
- The learning teacher and teacher education

1.3. Research programmes

• *Educational Neuroscience (Edu N)*

Educational Neuroscience combines the research programs Brain & Learning and Social Cognition as they existed up to 2015. The programme's mission is to increase understanding of individual development in an educational context, giving priority to so-called bridging studies at the intersection between neuroscience and educational science. Five research lines can be distinguished.

Individual differences in social cognition

The aims of this research line are 1) to study individual differences in social cognitive skills such as empathy and theory of mind, and their association with social network dynamics; 2) to study the influence of cultural orientations (e.g. individualism, collectivism and honour) on social cognitive skills.

Implicit beliefs

This research line studies the determinants, neural correlates and consequences of implicit beliefs about abilities in adolescents. The focus is on the distinction between entity beliefs

(abilities are fixed and innate) versus incremental beliefs (abilities can be improved through effort).

Reading

The focus of this research line is on the role of higher-order cognitive processes in (1) language and reading comprehension and (2) word problem solving. The research involves both fundamental and applied studies, ranging over topics from situation models to mental imagery to embodied cognition to abstract reasoning. The overarching theme underlying these diverse lines of research is the construction of a deep-level, meaning-based mental representation of the content that is studied. Some work within the research line focuses on the development of children's mathematical skills.

Executive functions

The research being carried out under the theme of Executive functions focuses on the development of “goal-directed behaviour” in young people in secondary education, and how this corresponds to academic performance. Some perform well while others make no progress whatsoever, and even appear to be at risk of dropping out. What causes this difference?

Clinical child and family studies

Child and adult development is embedded in social relations. The ‘Challenges to childrearing relationships’ research group studies the ways in which the quality of family relationships and care relationships interacts with cognitive, biological and behavioural development processes, and how this interaction can be improved by external help and support. The research is also partly embedded in the Institute for Health and Care Research (EMGO+), which is part of VU University Amsterdam and VU University Medical Centre Amsterdam.

- ***Meaningful Education in a Diverse Society (MEDS)***

The central theme of the research programme is the search for educational practices that best facilitate the development of children into adults who are able to lead a good life in a society that is culturally and religiously diverse. It combines two types of research: empirically informed theoretical research and theory driven and theory building empirical research. The programme is centred on two related themes:

Flourishing, ideals and identity

The focus of the first theme is on aspirations of parents and teachers with regard to personal formation of children. The main topics of research are: a) well-being (flourishing and happiness), b) education for a meaningful life, c) cultural and religious diversity. Furthermore, we investigate the desirability of religious arrangements of schools in relation to children's identity development.

Meaningful education and citizenship

Research within the second theme investigates the way in which educators and educational practices can best prepare children and youngsters to become citizens of a diverse society who critically contribute to the welfare of society. It addresses among others the problem of development of cultural agency, which aims at the formation of well-informed, critical and responsible citizens. It has particular interest in researching the appropriation of knowledge and abilities of high quality in a play-based and inquiry-based curriculum in Developmental Education schools.

‘Meaningful education’ is a shared research topic for both themes (and related researchers), which creates opportunities for collaboration, mutual exchange of ideas and projects that are productive for the elaboration of both themes.

- ***Personalized learning, differentiated teaching (PLDT)***

PLDT investigates the possibilities of personalization, and how it can improve education. The program distinguishes between two steps, which each generate their own set of research questions:

- **Diagnosis:** how can a teacher structure education so that he/she gets an accurate diagnosis of the learning process of the learner? What role can formative assessment play, concept checks, feedback discussions, and ICT? How can the learner and the teacher discover the learner has understood a text? For larger groups, can learning analytics be used to make learning visible, and how can this information be presented in a useful way for both the teacher and the learner?
- **Action:** how can a teacher, according to the diagnosis, personalize the education for the learner? What kind of strategies and (digital) tools does the teacher have? How can these strategies be taught to the teacher? What are the obstacles? Can education be changed in a way that it will be offering the appropriate learning content and practice? How can didactics be adapted accordingly? Is personalization already happening quite naturally by the actions of learners or peers? And, finally, the essential step: will such actions lead to greater and longer lasting learning results, and/or stronger motivation of the learner?

These questions are tackled at the following three levels of education:

- general secondary education (in the Netherlands: havo and vwo).
- higher education (university and college)
- education for teachers (teacher training courses and seminars for teachers)

Next to the research inspired by the above questions, the group also performs research into specialized didactics for school subjects. This research is largely determined by questions from educational practice (e.g., target language use in the field of modern foreign language teaching).

- ***Socially accountable undergraduate medical education (SAUME)***

This School of Medical Sciences programme comprises four domains of research: Faculty development, Pharmacotherapy education, Socially accountable undergraduate medical education and Continuing Professional Development. The research programme led by Dr. Rashmi Kusrkar and Prof. Gerda Croiset under the theme Socially Accountable Undergraduate Medical Education focuses on research geared towards finding out how to develop students for life. “Students for life” are students who constantly interact with their environment, integrate learning and practice, and are ready to invest in continuing professional development. This vision has been recently made into a film which is accessible at:

<https://www.youtube.com/watch?v=-h7klf-IZFM>

Research addresses the following topics:

Motivation, learning and academic performance

Is academic performance (cognitive and clinical performance, professional behaviour and dropout behaviour) of medical students associated with academic motivation, learning strategies, engagement, burnout, empathy, professional identity and personality characteristics? What are the mechanisms? Are there differences in these mechanisms between ethnic minority and Dutch students?

Effects of Selection:

What are the effects of student selection for medical school on the medical student population in terms of their motivation, engagement and academic performance? Motivation of ethnic minority students:

What are the factors in the informal and hidden curricula that influence the motivation of the ethnic minority students negatively?

Inter-professional Education:

How do students from medical and nursing education learn with, from and about each other?

Professional behaviour:

What are the underlying problems for unprofessional behaviour in medical students, and what are possible remediation measures for students that have been graded “unsatisfactory” due to their professional behaviour?

Faculty Development:

How does the professional identity of teachers develop? What are the tools of agency for this process?

How do teachers differ on their concepts of learning and teaching? Can we identify different groups among teachers working in a student-centered versus a traditional curriculum on the basis of their concepts of teaching and learning?

Academic motivation of ethnic minority students

Which factors influence the academic motivation of ethnic minority students? What are the mechanisms? How motivation does influence their academic performance?

Continuing Professional Development

Which factors influence a medical specialist’s motivation for lifelong learning? What are the mechanisms?

The section Pharmacotherapy at VUmc School of Medical Sciences conducts scientific research in pharmacotherapy education through the Research & Expertise Center In Pharmacotherapy Education (RECIPE). The objectives of RECIPE are: 1. The development of effective and attractive education for undergraduate and postgraduate students and teachers, based on knowledge of the process of therapeutic thinking and acting, as well as on recent insights in the field of education (evidence-based education) and 2. Conducting research concerning the process of therapeutic thinking and acting of physicians and under- and postgraduate students, particularly the treatment and drug selection process, both theoretically (declarative research), as well as in relation to schooling and training (impact research), selection process, both theoretically (declarative research), as well as in relation to schooling and training (impact research).

1.4. Organisation

Board

In 2016 the governing board of LEARN! consisted of prof. dr. P. Beek (chair), prof. dr. Michel ter Hark, prof. dr. C. Schuengel and Margreeth van der Meijde MBA.

Executive Management

In 2016 prof dr. M. Meeter was director of LEARN!, with support from Aisha Wiersma.

Programme committee

The Programme Committee consisted of the coordinators of the five research lines:

- prof L. Krabbendam / dr. M. Huizinga – Educational Neuroscience;
- prof D. de Ruyter – Meaningful Education in a Diverse Society;
- prof. M. Meeter – Personalized Learning & Differentiated Teaching;
- prof. G. Croiset / dr. Rashmi Kusrkar – Socially accountable medical education.

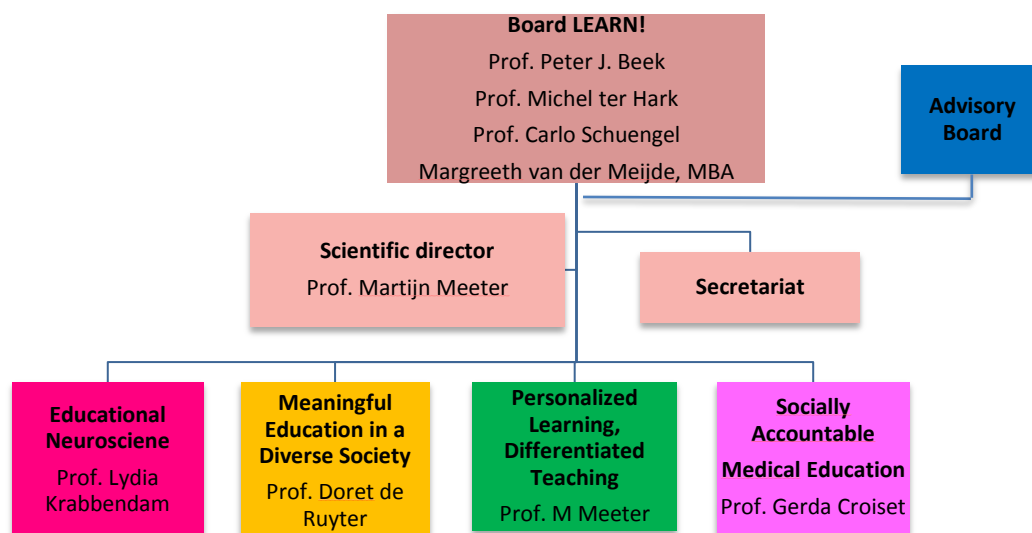
Advisory board

In order to keep a close eye on educational developments and the needs of educators, LEARN! set up an advisory board with representatives of various educational streams.

The advisory board consists of the following members:

- Maarten Faas, president board of directors orthopedagogical centre 'De Ambelt', Zwolle (primary, secondary and vocational education)
- Ivo van Hilvoorde, professor 'Exercise, School and Sport' Windesheim, Zwolle and sports philosopher VU University, Amsterdam (higher education)
- Rien Spies, director Agora group of primary schools, Noord Holland (primary education)
- Joost van Rijn, director O.R.S. Lek en Linge, Culemborg (secondary education)
- Dolf van Veen, professor urban education and youth policy Inholland, Haarlem (higher education)
- Roel de Vries, director Julianaschool, Schagen (primary education).

1.5 Organization Chart



2. COMPOSITION

2.1. Research Staff

The total number of scientific personnel in 2015 was 82 amounting to 32.86 full time research fte committed to LEARN! The Faculty of Behavioural and Movement Sciences is the largest contributor followed by VU University Medical Centre. The breakdown per job category is provided in table 1, for LEARN! as a whole as per research programme. To provide some context, data from the previous year have been added.

Table 1: (SEP D3a) Research staff for the institute and per programme

LEARN!	2015	2016
Scientific staff (1)	36 / 9.82 fte	31 / 9.29 fte
Post-docs (2)	21 / 8.68 fte	9 / 3.93 fte
PhD-students (3)	25 / 14.44 fte	16 / 7.93 fte
Total research staff	82 / 32.86 fte	57 / 21.36 fte

Edu N	2015	2016
Scientific staff (1)	12 / 3.21 fte	10 / 2.69 fte
Post-docs (2)	18 / 7.49 fte	7 / 3.38 fte
PhD-students (3)	11 / 8.5 fte	8 / 4.05 fte
Total research staff	41 / 19.2 fte	25 / 10.14 fte

MEDS	2015	2016
Scientific staff (1)	10 / 2.87 fte	9 / 2.74 fte
Post-docs (2)	0 / 0.00 fte	1 / 0.20 fte
PhD-students (3)	2 / 1.44 fte	2 / 0.96 fte

Total research staff **12 # / 4.31 fte** **12 / 3.89 fte**

PLDT	2015	2016
Scientific staff (1)	12 / 2.67 fte	9 / 2.86 fte
Post-docs (2)	3 / 1.18 fte	1 / 0.2 fte
PhD-students (3)	1 / 0.8 fte	0 / 0 fte
Total research staff	16 # / 4.65 fte	11 / 3.06 fte

SAUME	2015	2016
Scientific staff (1)	2 / 1.00 fte	2 / 1 fte
Post-docs (2)	0 / 0.00 fte	1 / 0.35 fte
PhD-students (3)	7 / 3.70 fte	6 / 2.92 fte
Total research staff	9# / 4.7 fte	9 / 4.27 fte

Note 1: Comparable with WOPI-categories HGL, UHD en UD; tenured and non-tenured staff

Note 2: Comparable with WOPI-category Onderzoeker

Note 3: Standard PhD (employed) and Contract PhD's (externally or internally funded but not employed)

Edu N: Educational Neuroscience

MEDS: Meaningful Education in a Diverse Society

PLDT: Personalized Learning, Differentiated Teaching

SAUME: Socially Accountable Medical Education

See appendix A for a complete list of all research staff that participated in LEARN!

2.2. Financial input

Table 2 provides an overview of the various sources for financing the research staff in LEARN!. A total of 49 % of the researchers' salaries comes from direct University funding ('1e geldstroom'). 41% comes from research grants obtained in scientific competition from public funding agencies like NWO, ZonMw and the ERC ('2e geldstroom'). The remaining 11% is funded via contract research contracts (15,6%; '3e geldstroom').

LEARN!	2015	2016
Direct funding (1)	16.16 fte / 48.6%	13.09 fte / 56.2%
Research grants (2)	13.53 fte / 40.7%	7.60 fte / 32.6%
Contract research (3)	3.57 fte / 10.7%	2.6 fte / 11.1%
Other (4)	-	-
Total funding	33.26 fte	23.29 fte

Edu N	2015	2016
Direct funding (1)	5.71 fte / 29.1 %	2.85 fte / 26.4 %
Research grants (2)	12.39 fte / 63.2 %	7.31 fte / 68.1 %
Contract research (3)	1.5 fte / 7.7 %	0.59 fte / 5.5 %
Other (4)	-	-
Total funding	19,6 fte	10.75 fte

MEDS	2015	2016
Direct funding (1)	3.59 fte / 83,3 %	4.09 fte / 77.9 %
Research grants (2)	0 fte / 0 %	0.27 fte / 5.1 %
Contract research (3)	0.72 fte / 16,7 %	0.9 fte / 17.1 %
Other (4)	-	-
Total funding	4.31 fte	5.25 fte

PLDT	2015	2016
Direct funding (1)	2,68 fte/ 57,6 %	2.16 fte / 70.6 %
Research grants (2)	1,12 fte/ 24,1 %	0 fte / 0 %
Contract research (3)	0,85 fte/ 18,3 %	0.9 fte / 29.4 %
Other (4)	-	-
Total funding	4.65 fte	3.06 fte

SAUME	2015	2016
Direct funding (1)	4.18 fte / 89%	4 fte / 94.6 %
Research grants (2)	0.02 fte / .4%	0.02 fte / 0.5 %
Contract research (3)	0.5 fte / 10.6%	0.21 fte / 5.0 %
Other (4)	-	-
Total funding	4.70 fte	4.23 fte

Note 1: Direct funding (basis financiering / lump sum budget)

Note 2: Research grants obtained in national and European scientific competition (e.g. grants from NWO and ERC)

Note 3: Research contracts for specific research projects obtained from external organisations, such as industry, governmental ministries, European organisations and charity organisations

Note 4: Funds that do not fit the other categories

Edu N: Education Neuroscience

MEDS: Meaningful Education in a Diverse Society

PLDT: Personalized Learning, Differentiated Teaching

SAUME: Socially Accountable Medical Education

3. RESEARCH QUALITY

3.1 Research Output

LEARN!	2015	2016
Refereed articles	107	97
Non-refereed articles (2)	0	0
Books	6	3
Book chapters	24	20
PhD-theses	5	8
Conference papers	58	
Professional publications (3)	17	16
Publications aimed at the general public (4)	2	17
Total publications	219	179

Educational Neuroscience	2015	2016
Refereed articles	64	52
Non-refereed articles (2)	0	0
Books	2	0
Book chapters	6	7
PhD-theses	3	3
Conference papers	25	0
Professional publications (3)	5	0
Publications aimed at the general public (4)	1	0
Total publications	106	62

MEDS	2015	2016
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Refereed articles	18	22
Non-refereed articles (2)	0	0
Books	3	2
Book chapters	8	12
PhD-theses	2	1
Conference papers	10	
Professional publications (3)	8	14
Publications aimed at the general public (4)	0	17
Total publications	49	68

PLDT	2015	2016
Refereed articles	6	18
Non-refereed articles (2)	0	0
Books	1	0
Book chapters	9	1
PhD-theses	0	2
Conference papers	4	
Professional publications (3)	3	2
Publications aimed at the general public (4)	1	0
Total publications	24	23

SAUME	2015	2016
Refereed articles	19	23
Non-refereed articles (2)	0	0
Books	1	1
Book chapters	1	0
PhD-theses	0	2
Conference papers	19	0
Professional publications (3)		0
Publications aimed at the general public (4)		0
Total publications	40	26

Note 2: Articles in journals that are non-refereed, yet deemed important for the field

Note 3: Publications aimed at professionals in the public and private sector (professionele publicaties), including patents and annotations (e.g. law).

Note 4: Also known as “populariserende artikelen”.

Note 5: Other types of research output (if applicable), such as patents, editorships, inaugural lectures, designs and prototypes (e.g. engineering) and media appearances.

Edu N: Education Neuroscience

MEDS: Meaningful Education in a Diverse Society

PLDT: Personalized Learning, Differentiated Teaching

SAUME: Socially Accountable Medical Education

3.2 Key Publications

1. Boonen, A.J.H., Wesel, F., van, Jolles, J., & Schoot, M., van der. (2014). The role of visual representation type, spatial ability, and reading comprehension in word problem solving: An item-level analysis in elementary school children. *International Journal of Educational Research*, 68, pp. 15-26
2. Boonen, A. J. H., de Koning, B. B., Jolles, J. J., & van der Schoot, M. (2016). Word problem solving in contemporary math education: A plea for reading comprehension skills training. *Frontiers in Psychology*, 7, 1-10.

3. Derks, J., Jolles, J., van Rijn, J., & Krabbendam, L. (2016). Individual differences in social cognition as predictors of secondary school performance. *Trends in Neuroscience and Education*, 5, 166-172.
4. van der Veen, C., Dobber, M., & van Oers, B. (2016). Implementing dynamic assessment of vocabulary development as a triological learning process: A practice of teacher support in primary education schools. *Language Assessment Quarterly*, 13, 329-340.
5. van Bergen, D. D., Ersanilli, E. F., Pels, T. V. M., & de Ruyter, D. (2016). Turkish-Dutch youth's attitude toward violence for defending the in-group. What role does perceived parenting play? *Peace and Conflict: Journal of Peace Psychology*, 22, 120-133.
6. Coenen, J., & Van Klaveren, C. (2016). Better Test Scores with a Same-Gender Teacher? *European Sociological Review*, 32, 452-464.
7. Veen, M., & de la Croix, A. (2016). Collaborative Reflection Under the Microscope: Using Conversation Analysis to Study the Transition From Case Presentation to Discussion in GP Residents' Experience Sharing Sessions. *Teaching and Learning in Medicine*, 28, 3-14.
8. Mak-van der Vossen MC, Van Mook W, Kors JM, Van Wieringen WN, Peerdeman SM, Croiset G, Kusurkar RA. Distinguishing three unprofessional behavior profiles of medical students using latent class analysis. *Academic Medicine* 2016; 91(9):1276-1283.
9. Wouters A, Croiset G, Galindo-Garre F, Kusurkar RA. Motivation of medical students: selection by motivation or motivation by selection. *BMC Medical Education* 2016; 16 :37.

3.3 Indicators of esteem

LEARN!	2015	2016
Awards	19	14
Grants	4	9
Invited Lectures	62	57
Editorial positions	11	10
Organisation of conferences / workshops	6	7

Edu N	2015	2016
Awards	5	3
Grants	0	1
Invited Lectures	23	12
Editorial positions	2	3
Organisation of conferences / workshops	1	2

MEDS	2015	2016
Awards	0	0
Grants		2
Invited Lectures	25	24
Editorial positions	8	7
Organisation of conferences / workshops	4	1

PLDT	2015	2016
Awards	1	0
Grants		2
Invited Lectures	7	2
Editorial positions	1	1
Organisation of conferences / workshops		

SAUME	2015	2016

Awards	13	11
Grants	4	4
Invited Lectures	6	19
Editorial positions	4	0
Organisation of conferences / workshops	1	4

Edu N: Education Neuroscience

MEDS: Meaningful Education in a Diverse Society

PLDT: Personalized Learning, Differentiated Teaching

SAUME: Socially Accountable Medical Education

4. SOCIETAL RELEVANCE

4.1 Overview

Societal impact is of utmost importance to LEARN! Of its three aims, two (Integration of basic and applied research, and knowledge transfer with special attention to the formulation of relevant research questions and translation of research results into applications and everyday practice in the home, at school, and in other environments) fall squarely within the concept of societal impact.

Integration of basic and applied research is organized through:

- (a) Structural collaboration with schools for primary and secondary education, universities of applied sciences, municipalities, such as the city of Amsterdam, intermediary institutions such as Platform Betatechniek, educational publishers and industry.
- (b) External PhD students who have research & teaching positions in Universities of Applied Sciences or schools, in this way embodying the close interaction between research and educational practice.
- (c) Interaction between programme leaders and the advisory board consisting of representatives of various educational streams met twice and gave the programme leaders valuable input for their research.
- (d) development of academic workplaces (see below)

The transfer of knowledge is organised through:

- (a) public lectures and professional publications;
- (b) The University Centre for Behaviour and Movement (UCGB), which offers teacher training for secondary school teachers, a master's programme aimed at universities of applied sciences (HBO) teachers, professional development courses for teachers in secondary and higher education and courses in educational sciences;
- (c) Collaboration with 'De Activiteit', an organisation for the implementation and support of Developmental Education in primary schools;

Looking at the indicators of societal impact shown in the next sections, it becomes clear that LEARN! researchers are prolific in transmitting the products of their research to professionals and the general public: each year they write many professional publications and publications aimed at the general public (such as newspaper articles), and they contributed to many reports. Some reports came out of contract research, which were awarded regularly to LEARN! researchers. Members of LEARN! were also active in extra-academic committees on the basis of their expertise, for example in the field of educational and youth policy and in the field of diversity in education.

Products for society. Over the years, LEARN! has engaged in many projects of applied research. One example is the research that led to PestPlotter, a tool used in schools to plot the social dynamics in school classes that lead to bullying. This tool came out of the dissertation of PhD student Jeroen Pronk, with dr Frits Goossens as his daily advisor. PestPlotter is currently being implemented in primary and secondary schools in the Netherlands.

Notwithstanding the success of LEARN!'s efforts at creating societal relevance, there are some opportunities that are not yet fully taken advantage of. For example, teacher education at VUA is supported by groups within LEARN!, but links to LEARN! research are not yet as strong as they can be.

4.2 Indicators of esteem

LEARN!	2015	2016
Contributions to public documents	0	1
Contributions to policy reports	1	3
Appointments / Positions paid by societal groups	2	3
External PhD positions	16	14
Use of datasets, software tools, instruments by societal groups	2	2
Use of datasets, software tools, instruments by peers	2	5
Contributions, based on research, to post initial / contract education	0	0

Contributions to public documents:

- C.J. van Kruistum:
Authors: van Kruistum, C.J., van Steensel, R. (2016). Title: Young children (0-8) and digital technology. Publisher: Vrije Universiteit & Erasmus Universiteit Rotterdam. Type: Dutch national report

Contributions to policy reports

- T.V.M. Pels:
Authors: Day, M., T.V.M. Pels, Gilsing, R. (2016). Title: Eigen voorzieningen van migranten in het jeugddomein: Een literatuuronderzoek. Publisher: Verwey-Jonker Instituut/Kennisplatform Integratie & Samenleving. Type: [type rapport?]

Authors: Pels, T.V.M., Hamdi, A., Klooster, E., Day, M., Lahri, F. (2016). Title: Pedagogiek Dar al-Hudaa: Een analyse van de Pedagogiek van Islamitisch Onderwijs van de stichting al Fitrah. Publisher: Verwey-Jonker Instituut. Type: [type rapport?]

Authors: Steketee, M., Romkens, R., Pels, T.V.M., Lunnemann, K., Smits van Waesberghe, E., Mak, J. ..., Harthoorn, H. (2016). Title: Preventie van intergenerationeel geweld Nederland en EU: verkenning van wat werkt. Publisher: Verwey-Jonker Instituut. Type: [type rapport]

Appointments / Positions paid by societal groups

- Positions (2): *Teacher educator*; Name Investor: *iPabo Amsterdam*; Start: *1-2-2012*; Running period: *63 months*
- Position: *PhD*; Name Investor: *Orthopedagogische Behandel Centra*; Start: *1-11-2012*; Running period: *48 months*
- Position – *Research Assistant*; Name Investor: *Association for Medical Education in Europe*; Start: *1.09.2016*; Running period: *24 months*

External PhD positions

Name candidate: *Schouten, S.*; Title: *Motivation for continuing professional development of pharmacists*; Start: *1-1-2014*; Planned end date: *1-1-2017*; Supervisors: *Anton de Boer, Gerda Croiset*; Co-supervisors: *Andries Koster, Rashmi Kusurkar*

Name candidate: *Gerdes, J.*; Title: *Effectieve ondersteuning van leerlingen binnen het regulier voortgezet onderwijs door verbeterde samenwerking tussen ouders, school en jeugdhulpverlening*
Supervisor: *Doret de Ruyter*; co-supervisors: *Sui Lin Goei, Mariëtte Huizinga*

Name candidate: *Van der Hoek, J.J.*; Title: *Socialisatie van jongere kinderen oor oudste broers en zussen in Turks-Nederkandse autochtone gezinnen*; Planned end date: *1-11-2016*; Supervisors: *Trees Pels*;

Name candidate: *Hogenes, S.*; Title: *Composition in Music Education in primary schools* Start: *1-9-2009*; Planned end date: *spring 2016*; Supervisors: *Bert van Oers*, Co-supervisors; *R. Diekstra*

Name candidate: *De Jong, W.*; Title: *Levensbeschouwelijke vorming in OGO*; Start: *1-1-2013*; Planned end date: *fall 2017*; Supervisors: *Bert van Oers, Siebren Miedema*

Name candidate: *Ponzoni, E.*; Title: *'The role of migrant organizations in the 'pedagogic infrastructure' of the city of Amsterdam' (Opvoedhulp in de 'huiskamer'. Conceptuele kaders voor de bijdrage van vrijwilligers uit migrantenkring aan een inclusieve ondersteuning van gezinnen binnen het Amsterdamse jeugdbeleid)*; Start: *1-4-2012*; Planned end date: *1-12-2015*; Supervisors: *Trees Pels, Hans Boutellier*

Name candidate: *Nieuwmeijer, C.*; Title: *Effects of cooperation between musician and teacher for music education of young children in free musical play*; Start: *1-6-2013*; Planned end date: *End 2017*; Supervisors: *Bert van Oers, Nigel Masrhall*

Name candidate: *Rezende Da Cunha, F.*; Title: *Social networks: integrating new technologies to secondary education classrooms*; Start: *1-1-2014*; Planned end date: *End 2017*; Supervisors: *Bert van Oers*, Co-supervisors: *Claudia van Kruistum, Michael Kontopodis*

Name candidate: *Van Rijk, Y.*; Title: *Reading comprehension in upper grades of primary school* Start: *1-12-2009*; Planned end date: *End 2016*; Supervisors: *Bert van Oers, Monique Volman*; Co-supervisors: *L. de Mey, D. de Haan*

Name candidate: *Stekelenburg, L.*; Title: *Vorming van hbo studenten tot verantwoordelijke professionals met een ethisch kompas*. Start: *1.12.2014* – Planned End date: *1.1.2019*; promotor: *Doret de Ruyter*; co-promotor: *Wouter Sanderse*

Name candidate: *Tertoolen, A.*; Title: *Listening to young children's voice*; Start: *Sept 2006*; Planned end date: *End 2016*; Supervisors: *Bert van Oers*, Co-supervisors: *J. Geldens, H. Popeijus*

Name candidate: *Valstar, J.*; Title: *De kindertheologische leeromgeving*; Start: *2011*; Planned end date: *End 2017*; Supervisors: *Siebren Miedema*

Name candidate: *De Vetten, A.*; Title: *Statistiekonderwijs voor (aankomende) leerkrachten primair onderwijs*; Start: *1-2-2012*; Planned end date: *1-11-2016*; Supervisors: *Bert van Oers*, Co-supervisors: *Judith Schoonenboom, R. Keijzer*

Name candidate: *Worthington, M.*; Title: *The emergence of early mathematical notions in young children* Start: *Nov 2007*; Planned end date: *Mid 2017*; Supervisors: *Bert van Oers*

Use of datasets, software tools, instruments by societal groups (incl. interventions)

Maroesjka van Nieuwenhuijzen, Maaïke van Rest, Carlo Schuengel

- Description: *Sociale Informatie Verwerkings-Test (diagnostic tool)*; External partners: *OBC and GGZ organisations, VOBC-LVB*; Name consortium: *ConSIVT*

Maroesjka van Nieuwenhuijzen, H. Schuiringa

- Description: *Samen Stevig Staàn (intervention)*; External partners: *OBC and VOBC-LVB*;

Use of datasets, software tools, instruments by peers (incl. interventions)

Gerda Croiset, Anouk Wouters, Nienke Schripsema, Janke Cohen-Schotanus:

- Description: *Data and infrastructure from our research group*; External partners: *NFU*;

Gerda Croiset, Rashmi A Kusrkar, Sharon Schouten, Andries Koster, Anton de Boer

- Description: *Infrastructure of our research group*; External partners: *PAOFarmacie, UU*;

Rashmi Kusrkar, Ijsbrand Kramer

- Description: *Infrastructure of our research group*; External partners: *University of Bordeaux, France*;

Rashmi Kusrkar, Liping Li, Min AN

- Description: *Infrastructure of our research group*; External partners: *Shantou University, China*;

Rashmi Kusrkar, Gerda Croiset, Marianne Mak-van der Vossen, Arianne Teherani

- Description: *Infrastructure of our research group*; External partners: *UCSF, USA*;

Contributions, based on research, to post initial education / Contract Education

5 Performance Indicators LEARN! 2016 per assessment dimension

		QUALITY DOMAINS	
ASSESSMENT DIMENSIONS	<i>Research quality</i>	<i>Relevance to society</i>	
<i>Demonstrable products</i>	1. Research products for peers	4. Research products for societal target groups	
	<ul style="list-style-type: none"> - Research articles refereed 97 - Research articles non refereed 0 - Scientific books 3 - Scientific book chapters 20 - PhD Thesis 8 - Conference papers 0 - Lectures aimed at peers 57 	<ul style="list-style-type: none"> - professional publications 16 - publications aimed at general public 17 - lectures aimed at professionals and the general public - contributions to public documents 1 - contributions to policy reports 3 	
<i>Demonstrable use of products</i>	2. Use of research products by peers	5. Use of research products by societal groups	
	<ul style="list-style-type: none"> - Use of datasets, software tools, instruments by peers 5 	<ul style="list-style-type: none"> - Research contracts - Use of datasets, software tools, etc. by societal groups 2 	
<i>Demonstrable marks of recognition</i>	3. Marks of recognition from peers	6. Marks of recognition by societal groups	
	<ul style="list-style-type: none"> - Science awards / prizes 14 - Research grants 4 - Key notes 57 - Editorial positions 10 - Memberships with scientific relevance 	<ul style="list-style-type: none"> - Number of positions paid by societal groups - External PhD positions - Memberships with societal relevance - Contributions to post initial / contract education 14 	

6. VIABILITY

6.1 SWOT Analysis

<i>Internal organisation</i>	Strengths	Weaknesses
	<ul style="list-style-type: none"> - International and national recognition of research - Strong relations with other (inter)national research groups - Strong presence in the internationally strongly growing field of Educational Neuroscience - Strong relations with societal partners - Multidisciplinary, with strong relation between basic and applied aspects and possible dissemination to educational practice - Clear societal visibility - Good earning capacity 	<ul style="list-style-type: none"> - Relatively small senior staff - Somewhat divergent themes that are not all highly visible internationally - Not all groups equally able to obtain external funding
<i>External context</i>	Opportunities	Threats
	<ul style="list-style-type: none"> - Research on educational themes like diversity (in gender and culture), professionalization, executive functions has high societal priority - Education is high on the agenda of VUA - Education sciences are experiencing a rising tide in the Netherlands, with opportunities arising for LEARN! from both the sector plan and the national science agenda. - Strong interest in brain and behaviour in educational organizations and general public; necessity for educational reform; much interest in neuroscience in grant giving organizations - High societal relevance - Our network of schools for Developmental Education, Institutes for Initial Teacher Education and School counselling services provide opportunities for links with practice, and for collaboration in submitting bids 	<ul style="list-style-type: none"> - Decline in overall amount of funding NWO/NRO, leading to increasingly fierce competition for research funds - Further decline in the amount of direct research funding from the university (partly reflecting declines in the funding reaching the university from the ministry of education). - Increased teaching and management loads for senior staff - Further decline of first stream funding of research

7. EARNING CAPACITY

Funding strategy

In order to support and stimulate (interdisciplinary) grant applications the LEARN! management formulated an overall funding strategy for the years 2014-2017. This strategy shows the link between research and funding targets and describes the goals, conditions and directions for funding, together with a list of national and international grant providers and potential collaborators in the public sector. The overall funding strategy is worked out in action plans per research programme.

Project description	Grant	2016
ERC StG N.Atteveldt BRAINBELIEFS	Europese Commissie	€ 1.597.291
Sociale relaties en ICT: bevorderen van	ZonMW	€ 526.329
ZonMw project NSKK	ZonMW	€ 514.336
flexibel traject in instituut en opleidi	Ministeries	€ 99.250
NRO Project mindmappen	NWO	€ 96.830
Erasmus plus J.Dengerink	Europese Commissie	€ 45.279
STW Take-off fase 1 Reflect	STW	€ 39.700
Onderzoek Betaalmiddel, betaalpijn en im	Overig	€ 27.900
NRO MIBOproject	NWO	€ 25.569
Academic motivation of ethnic minority students	AMEE Research Grant	€9557
Total		€ 2.972.484

8. COLLABORATIONS

8.1 National collaborations

Nationally, LEARN! researchers have close ties with professional organisations outside the university, such as universities of applied sciences (Saxion, HvA, InHolland, HU, iPabo, Windesheim), schools for secondary and primary education, municipalities (e.g. Foundation Flore, Foundation Tabijn, Ogo-schools, City of Amsterdam) school advisory organisations (e.g. De Activiteit, OBD Noord-West) and publishers (e.g. ThiemeMeulenhoff).

Furthermore, researchers of LEARN! interact and collaborate closely with each other and other national research partners. A selection of the most important partners in 2016 can be found below per research programme.

Edu N	MEDS	PLDT	SAUME
Prof. dr. L. Verhoeven, Univ. Nijmegen Prof. dr. A. Aleman, UMCG Prof. dr. H. Swaab, UL Prof. dr. E. Crone, UL Prof. dr. P. van Geert, RuG Prof. dr. R. Goebel, UM Dr. R. de Groot, Open Univ. Prof. dr. R. Ridderinkhof, UvA Prof. dr. P. Leseman, UU Prof. dr. J. van Os, UM	Prof. dr. M.L.L. Volman & Prof. dr. M. Merry, UvA Prof. dr. K. Boersma, UU Dr. Bram de Muynck, Driestar Dr. R. Keizer & Dr. A. Boland, Ipabo, Prof. dr. Jan Hoogland, VIAA B. Pompert & N. Fijma, De Activiteit,	Prof. dr. M.L.L. Volman, UvA Prof. dr. M. Brekelmans, UU Prof. dr. F.J.J.M. Janssen, UL Prof. dr. W. van Joolingen, UU	Prof. dr. M.L.L. Volman, UvA Prof. dr. J Cohen-Schotanus, UMCG Prof. dr. C van der Vleuten, Prof. dr. A Scherpier., Prof. Dr. Walther van Mook, MUMC Prof. dr. A de Boer, Dr. A Koster, UU & Prof. dr. T.h.J. Ten Cate, Dr. H.E. Westerveld, UMCU Dr Robert Hulsman and Dr Gerard Spaai, Amsterdam Medical Center

8.2 International collaborations

Internationally, LEARN! researchers collaborate with:

Edu N	MEDS	PLDT	SAUME
Prof. dr. S. Shergill (King's college, London); Prof. dr. S.J. Blakemore (UCL, London)	Prof. Marilyn Fleer and Prof. dr. N. Veresov, Monash University Melbourne, Australia; Ghent University, Belgium, Prof. dr. P. Smeyers Clark University, Prof. S. Michaels	Prof. dr. W. Doyle (Univ of Arizona, US) Prof. dr. J. Grainger (Univ Aix-Marseille, France) Esther Canrinus & karen Hamerness (Univ of Oslo)	Prof. Dr. A. Teherani, University of California San Francisco, USA Dr. Marieke Koster and Prof. Dr. Timothy Smith, Harvard University, USA Prof. Dr. Liping Li and Dr. AN Min, Shantou Medical College, Shantou University, China Prof. Dr. J. Gonnella and Prof. Dr. M. Hojat, Sidney-Kimmel

			Medical College, Thomas Jefferson University, Philadelphia, USA Late Prof Dr KV Mann, University of Dalhousie, Canada Prof Dr I. Kramer, University of Bordeaux, France
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Moreover, as an institute LEARN! collaborates with:

- International research communities such as STEP AERA, RDC Professional Development of Teacher Educators ATEE, PESGB and AME; The Executive Committee of EARLI;
- GI4all European IT network with GIS research institute at the University of Salzburg;
- The International Mind Brain Learning Society (IMBES), specifically within the committee for the development of educational neuroscience, and the steering group Brain, Learning and Education instigated by the OESO (Centre for Educational Research and Innovation, CERI);

9. QUALITY CONTROL

9.1 Research ethics and data storage

Research institutes at Vrije Universiteit are increasingly expected to play a role in quality control. This includes guarding against ethical transgressions by its researchers, and making sure that data is stored in an appropriate way, safeguarding privacy of participants but archiving it and making it available as much as possible to the research community.

Ethical vetting occurs within the faculties that are part of LEARN! Each faculty has its own ethics committee, while the SAUME programme makes use of the ethics committee of the association for research into medical education (NVMO, http://www.nvmo.nl/ethische_toetsing_onderzoek). However, this does not cover all aspects of good science practices. LEARN! therefore in 2016 developed an ethics self-check that results in a green, yellow or red light on the aspects of data management, sensitivity to privacy, and overall ethics. As of December 2016, this list self-check was completed by most researchers within LEARN! – so far only as a self-assessment. A new version will be sent out in summer 2017, with follow-up conversations planned with those researchers that continue to score red on one or more aspects.

9.2 Quality of research

In order to ensure the quality of research the LEARN! management applies increasingly stringent admission criteria. University staff members who wish to be admitted to LEARN! now have to meet the following criteria:

1. The candidate has to be employed in a faculty of VU University;
2. The candidate should hold a doctorate by the time of admission;
3. The candidate should play an active role in at least one of the research programmes of LEARN!;
4. The candidate should have at least six international publications in the five years prior to the date of admission. Publications include journal articles, books, and book chapters. No more than two out of six publications can be books/book chapters. Journal articles are accepted only if they are not book reviews or editorial contributions, and if the journal appears on the ISI-list.

APPENDIX

A: List of researchers per programme

Educational Neuroscience

van Atteveldt, N.M.
Boerma, I.E.
Boonen, A.J.H.
Fan, M.L.F.
Fett, A.J.
Finkenauer, C.
Flinkenflögel, N.H.
Gromann, P.M.
Hanssen, E.M.E.
van der Heyden, K.M.
Huizinga, M. (Mariëtte)
Huizinga, M. (Milou-Elaine)
Iliás, M.A.H.
Jansen, I.L.J.
Jolles, J.
Kesteren, M.T.R. van
Koning, B.B. de
Krabbendam, A.C.
Kraker-Pauw, E. de
Lee, N.C.
Lieshout, E.C.D.M. van
Loermans, A.C.
Meulen, A.N. van der
Mol, S.E.
Nieuwenhuijzen, M. van
Oosterman, M.
Pronk, J.
Rest, M.M. van
Roerig, S.
Schoot, M. van der
Ton, R.
van Tuyll van Serooskerken, J.M.
Schuengel, C.
Vu. V.T.
Willemen, A.M.

Personalized Learning & Differentiated Teaching

Beishuizen, J.J.
Berg, E. van den
Boschhuizen, R.
Bosma, T.
Cremer, M.
Croix, A. de la
Donszelmann, S.
Eegdeman, I.
Geraedts, C.L.
Glasbeek, H.A.
Goei, S.L.

Griffioen, D.
Handelzalts, A.
Haring, M.M.G.
Kaal, A.A.
Karkdijk, J.
van Klaveren, C.P.B.J.
Kroes, B.
Landa, I.
Loermans, A.C.
Lunenberg, M.L.
Malinen, O.P.S.
Meeter, M.
Oeveren, C.D.P. van
Pauw, I.
van der Ploeg, B.D.
Plukaard, S.C.
Pullen, A.G.
Ramdas, S.K.K.
Rens, E.E.M. van
Roerig, S.
Schee, J.A. van der
Snell, J.J.
Swennen, J.M.H.
Tran, B.T.
Visser, L.B.
de Vries, B.
Westbroek, H.B.
Wierik, M.L. te

Meaningful Education in a Diverse Society

Bertram-Troost, G.D.
Dobber, M.
Exalto, J.
Gerdes, J.
Koster, M.P.
Kruistum, C.J. van
Melchers, M.E.H.L.
Miedema, S.
Oers, H.J.M. van
Pels, T.V.M.
Rezende Da Cunha Júnior, F.
Rietveld-van Wingerden, M.
Ruyter, D.J. de
Schinkel, A.
Stekelenburg, M.H.M. van
Tavecchio, G.L.
Terwel, J.
Valstar, J.G.
Van Saane, J. W.
Veen, M. van der
Vetten, A.J. de
Wolbert, L.S.

Socially Accountable Undergraduate Medical Education

Agtmael, M.

Brinkman, D.

Burgt, S. van der

Caris, M.

Croiset, G.

Isik, U.

Jacobs, A.

Kusurkar, R. A.

Lankveld, T. van

Peerdeman, S.

Schutte, T.

Tichelaar, J.

Visser, C.

Wouters, A.

Mak- van der Vossen, M

Affiliated member LEARN!

de Graaf, G.

Konijn, E.