



Meltem Yurt

Storytelling with Augmented Reality

A Learning Tool for Children



Nomos

Edition Reinhard Fischer

Now Media

edited by

Prof. Harald Eichsteller,
HdM Hochschule der Medien Stuttgart

Prof. Dr. Marie Elisabeth Mueller,
HdM Hochschule der Medien Stuttgart

Prof. Devadas Rajaram,
Asian College of Journalism Chennai

Volmue 4

Meltem Yurt

Storytelling with Augmented Reality

A Learning Tool for Children



Nomos

Edition Reinhard Fischer

© Coverpicture: fotolia.com

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available on the Internet at <http://dnb.d-nb.de>

ISBN 978-3-8487-5774-9 (Print)
978-3-8452-9948-8 (ePDF)

British Library Cataloguing-in-Publication Data

A catalogue record for this book is available from the British Library.

ISBN 978-3-8487-5774-9 (Print)
978-3-8452-9948-8 (ePDF)

Library of Congress Cataloging-in-Publication Data

Yurt, Meltem
Storytelling with Augmented Reality
A Learning Tool for Children
Meltem Yurt
109 pp.
Includes bibliographic references.

ISBN 978-3-8487-5774-9 (Print)
978-3-8452-9948-8 (ePDF)

1st Edition 2019

© Nomos Verlagsgesellschaft, Baden-Baden, Germany 2019. Printed and bound in Germany.

This work is subject to copyright. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any information storage or retrieval system, without prior permission in writing from the publishers. Under § 54 of the German Copyright Law where copies are made for other than private use a fee is payable to "Verwertungsgesellschaft Wort", Munich.

No responsibility for loss caused to any individual or organization acting on or refraining from action as a result of the material in this publication can be accepted by Nomos or the author.

Abstract

This Bachelor's thesis deals with the use of Augmented Reality Storytelling for educational purposes. It investigates which value the technology combined with Storytelling as a learning tool adds to transferring knowledge to children aged 6 to 11. The theoretical framework is built upon the topic storytelling and its necessity for children as a tool for gaining knowledge, followed by technical basics of the technology Augmented Reality. Theoretical learning approaches and practical examples as well as studies about previous learning effects combine the foundation for the empirical examination in the paper. In order to answer the research question, a model built upon categories for AR storytelling developed on the basis of the current state of research will be implemented on three case studies of existing practice and examined afterwards. The results of the examination will be evaluated and put into practice-related context through guided expert interviews, which provides a summary of the question and a limitation of the engagement in AR Storytelling as a learning tool for children.

Keywords: Storytelling, Augmented Reality, Virtuality, Education, Added Value, Gamification, Discovery Learning, Content, Interaction, Immersion, Children, School

Table of Contents

Tabel of Figures	9
Table of Abbreviations	11
1 Introduction	13
1.1 Relevance of the topic and research question	13
1.2 Structure and procedure	16
2 Storytelling to impart knowledge to children	18
2.1 The essence of storytelling for children	18
2.2 Storytelling model	19
3 Augmented Reality	21
3.1 Clarification of terms and application possibilities of Augmented Reality	21
3.1.1 Definition by Azuma	21
3.1.2 Differentiation from other forms of Mixed Reality	22
3.1.3 Technical basics	22
3.1.4 Fields of application	24
4 AR as a tool for knowledge transfer	27
4.1 Potential of the target group children and adolescents	27
4.2 Theoretical approaches	28
4.3 Practical examples of AR for imparting knowledge to children	30
4.4 Studies on the learning effect	37
4.5 Determination of the complementary factors of AR	39
4.5.1 Three-dimensionality	39
4.5.2 Interaction	40
4.5.3 Real-Time-Effect	41
4.5.4 Location independence	41
4.5.5 User orientation	41

Table of Contents

4.5.6 Supplementary information	42
5 Empirical study	44
5.1 Objects of investigation	44
5.1.1 Priya's Shakti	44
5.1.1.1 Reasons for selection	45
5.1.1.2 Procedure and application of the model	46
5.1.2 Wonderscope	57
5.1.2.1 Reasons for selection	58
5.1.2.2 Procedure and application of the model	58
5.1.3 Conni learns Englisch	66
5.1.3.1 Reasons for selection	68
5.1.3.2 Procedure and application of the model	68
5.2 Summary and working hypothesis	71
6 Expert interviews	75
6.1 Presentation and justification of the selection of experts	75
6.2 Method selection and interview procedure	78
6.3 Assessment of the results	78
6.3.1 Technical components	79
6.3.2 Age group children	81
6.3.3 Self-determination and explorative learning	82
6.3.4 Storytelling in conjunction with AR	83
6.3.5 Role of the parents	85
7 Summary and limitation	86
Bibliography	89
Table of figures	95
Appendix: Transcripts of expert interviews	99

Tabel of Figures

Figure 1: Digi-Capital market forecast for VR/AR in trillions of dollars	14
Figure 2: IDC market forecast for AR & VR	15
Figure 3: Storytelling model	20
Figure 4: Reality-virtuality-continuum. Own representation	22
Figure 5: Use of EchoAR by a nurse	25
Figure 6: Areeka app in the theme booklet An interactive journey to Ancient Egypt	31
Figure 7: The Speaking Celt at the Celtic museum in Hallein	32
Figure 8: AR learning rally on the subject of witch-hunts according to Buchner	33
Figure 9: e-Leraning App Aug That! in use during one lesson	34
Figure 10: Metaverse platform for individual creation of interactive learning stories	35
Figure 11: ARMakr App in the iTunes Store	36
Figure 12: ARMakr App in the application for teaching language skills	36
Figure 13: Results from studies on learning outcomes through AR. Own presentation	37
Figure 14: AR storytelling model	43
Figure 15: Cover of the comic book Priya's Shakti	45
Figure 16: Blippar App in the iTunes Store	46
Figure 17: Presentation of the protagonist Priya in a hero's journey	47
Figure 18: Identification basis for Priya's Shakti	49
Figure 19: Hope as an emotionalizing element of history	50

Tabel of Figures

Figure 20: Reduction of complex issues such as rape to convey messages	51
Figure 21: Three-dimensional elements in Priya's Shakti	52
Figure 22: Interaction with external sources	53
Figure 23: Sensible solution for page change	54
Figure 24: Partially long waiting times for AR applications	55
Figure 25: Supplementing information using AR	56
Figure 26: Wonderscope in the iTunes Store	57
Figure 27: Presentation of the three historical protagonists	60
Figure 28: Reduction of complexity for "Amazing Stunts by Astounding People	61
Figure 29: Implementation of three-dimensionality	62
Figure 30: Interactive communication with protagonists	63
Figure 31: Customized instructions from Blop in real time	64
Figure 32: Interactive infoboxes through AR	65
Figure 33: Target group-specific implementation of the app	66
Figure 34: Conni learns English AR book with app	67
Figure 35: Overloading of interactive elements at Conni learns English	70
Figure 36: Josef Buchner	75
Figure 37: Annedore Fausak	76
Figure 38: Yiulia Parshina-Kottas	77

Table of Abbreviations

AR	Augmented Reality
VR	Virtual Reality
MR	Mixed Reality
ARS	Augmented Reality System
HMD	Head-Mounted-Display
MAR	Mobile Augmented Reality
Bio.	Billion
app	Abbreviation for application
cf.	Confer, latin for “compare to“
Fig.	Figure
e.g.	For example
para.	Paragraph
et al.	Et alia, latin for “and others“
i.e.	Id est, latin for “namely“
ibid.	Ibidem, latin for “cited just before“
sq.	Following page
sqq.	Following pages
n.d.	No date
c.a.	Circa