



Open and Scalable Learning Ecosystem based on LTI

Austrian Case Studies

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One of Austria's Leading EdTech Providers

since 2005 taking Advantage of OpenACS



E-Books



Feedback



LMS



Learning Content



E-Testing

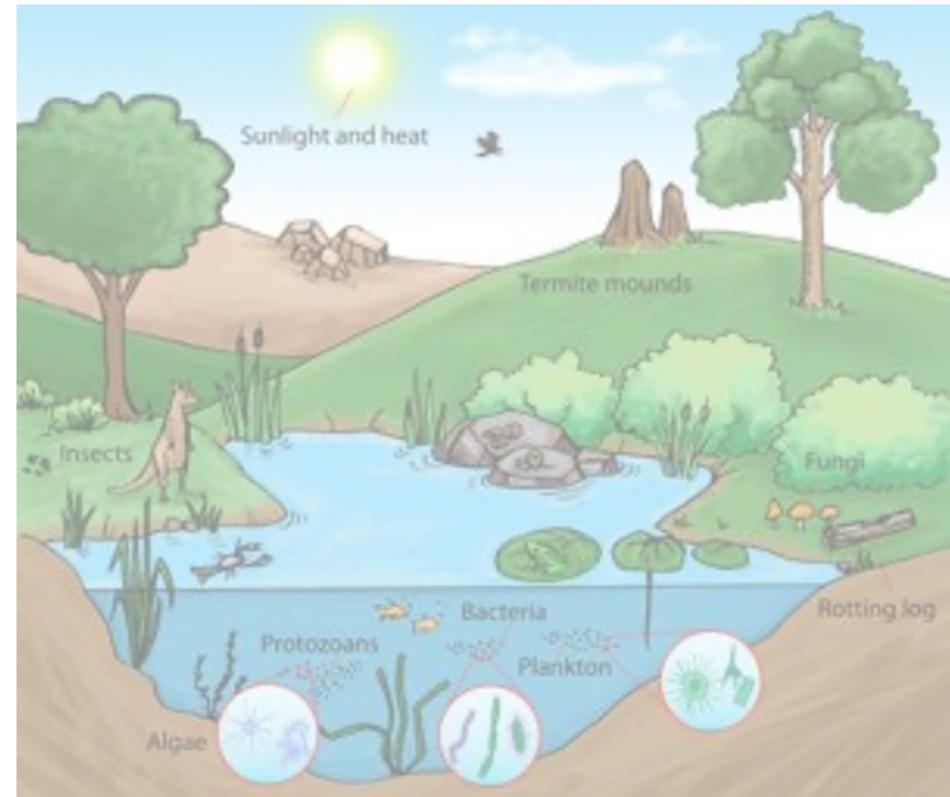


**Bespoke
Solution**

Learning Ecosystem

A (natural) ecosystem is a (biological) **community of interacting organisms** and their physical environment.

A learning ecosystem is the learning & teaching **community**, together with the **organisation(s) connected via educational technology**.



Learning Ecosystem: Issues

- Constituents & Governance
 - Structures
 - Processes
- Technological & Social Conditions
- Communications
- Relational mechanisms

“flow of energy” & “cycling of nutrients”

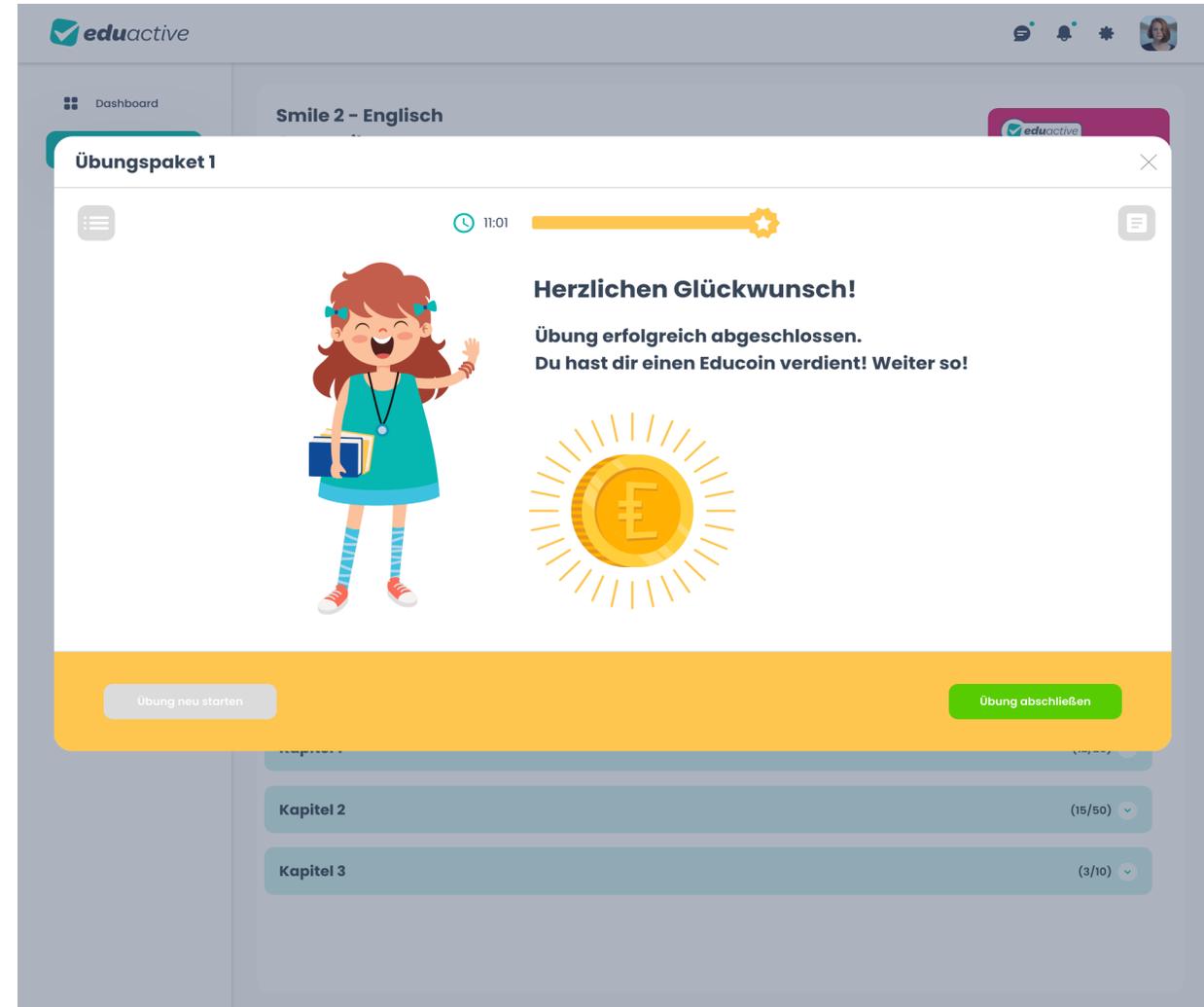


Case Study #1



Eduactive - Project Objectives

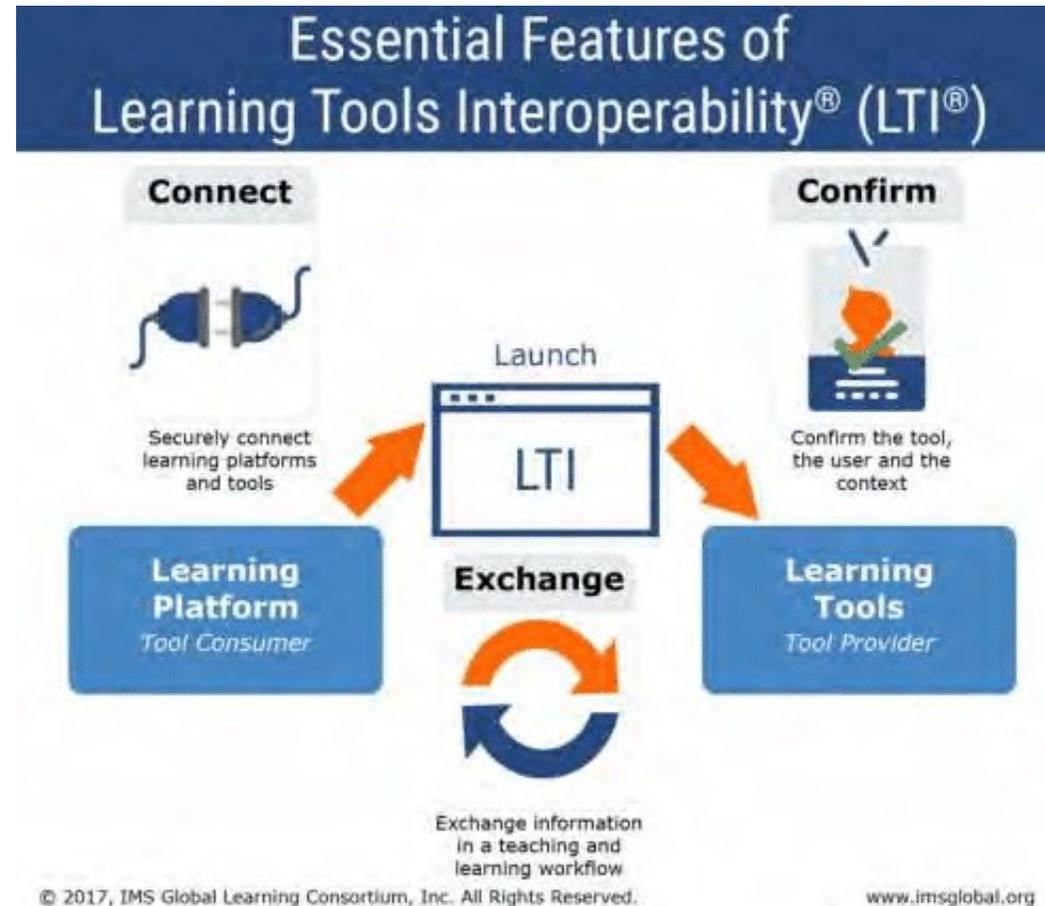
- Fill the gap in Central Europe's private teaching market by providing **interactive learning material** on key subjects
- Serve educators with interactive learning material to make more sense out of Austria's hardware initiative.
- Public-private cooperation between
 - Ministry of Education
 - Textbook publishers
 - Parents & learners
 - Instructors
 - Learning Management System Providers



Eduactive – Implementation per Stakeholder

Eduactive	Publisher	Parent Learner	Instructor
Compose & Webshop	E-Book Publishing	Webshop & LMS	Class Connector
Webshop LTI Compose	Publishing Service Delivery Service	Webshop, LTI Learning Management System	Class Connector, LTI Learning Management System

Connecting Learning Ecosystems using Learning Tools Interoperability (LTI)





Case Study #2

DIGI4SCHOOL

Digi4School - Project Objectives

Provide an “Austrian Answer” to the international trend of an increased adoption of **digital textbooks** in secondary education

Key service in Austria’s secondary education: 900.000 registered users (out of 1.2 pupils)

Public-private cooperation between

- Ministry of Education
- Ministry of Family Affairs (and its predecessors)
- Austrian Chamber of Commerce
- Textbook publishers
- Booksellers
- Learning Management System Providers

The screenshot shows a digital textbook page for Unit 1, titled "That's me". The page is divided into several sections:

- Speaking:** Includes an "Introducing a person" task and a "VocabBooster" section with a list of adjectives (e.g., bossy, optimistic, sensitive, moody, sensible, shy, friendly, helpful, anxious, curious, talkative, lazy).
- LanguageBox:** Contains a "VocabBooster" section with a list of adjectives and a "LanguageBox" section with a list of adjectives.
- Appearances:** Includes a "VocabBooster" section with a list of adjectives and a "LanguageBox" section with a list of adjectives.
- Language in use:** Includes a "Describing a person's personality" task and a "VocabBooster" section with a list of adjectives.

The interface also features a navigation bar at the top with icons for home, search, and navigation, and a "Markierungen" (Annotations) panel on the right side.

Digi4School – Implementation per Stakeholder

Ministry of Education	Bookseller	Publisher	Learner	Instructor
Approbation Service	Access Code Generator	E-Book Publishing	Bookshelf	Class Connector
Publishing Service	Publishing Service	Publishing Service LTI E-Book+ Delivery Service	Bookshelf, LTI Learning Management System, App	Class Connector, LTI Learning Management System

Digi4School – Selected Design Principles

- 👤 Learner-centred approach
- 👤 Personal access codes based on school's book orders
- 👤 GDPR compliant
- 👤 Instructor-support via "class connector"
- 👤 Top usability driven by intense usability testing
- 👤 High scalability
- 👤 Interfaces to third-party websites
 - 👤 Learning Management System(s): Moodle & LMS.at
 - 👤 Authorisation services for Instructors
 - 👤 Bookseller Vendor Portal

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Optimizing usability testing in the context of a large-scale software service for digital textbooks

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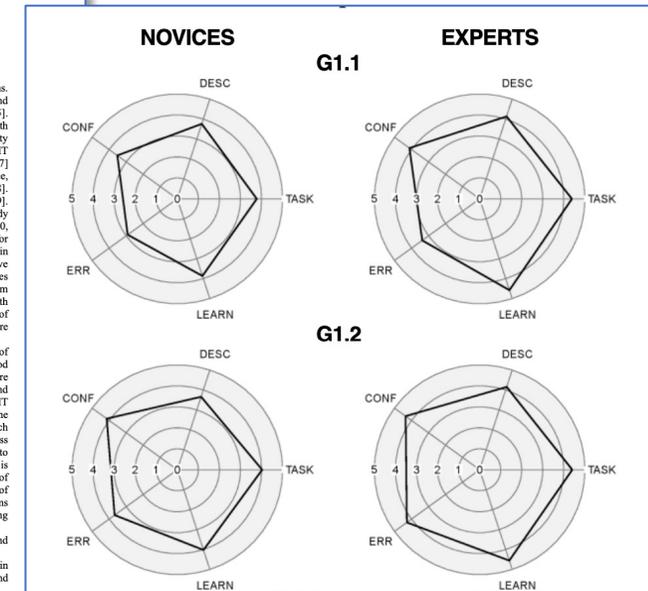
Abstract
The adoption of digital textbooks in education has steadily increased. This paper reports on the initiative Digi4School aiming to provide a large-scale software service for digital textbooks. Since the usability of this service is of particular concern, it is the subject of a design science research project with the goal to investigate two artifacts: (1) an optimized method for usability testing and (2) a fully-functional software service for delivering digital textbooks to users with heterogeneous IT background. We conclude that a combination of usability tests and the use of a questionnaire including closed and open-ended questions is recommended. Furthermore, both novice and expert users should evaluate a system's usability with iterations until the usability measures reach a satisfactory level for all users. This was achieved for Digi4School. Such an approach has the potential to identify and eliminate flaws that prevent users from adopting the system.

1. Introduction
Driven by advances in e-book technologies as well as by the surge of e-book usage generally, the adoption of digital textbooks in education has steadily increased [1]. In central Europe, for example, there are several country-wide initiatives as well as individual activities of leading publishing houses which have successfully been accepted by early adopters. However, when it comes to attracting users beyond the early adopters stage, the usability of the software service that provides digital textbooks becomes of utmost importance [2]. In particular, inexperienced users need to be enabled to successfully complete tasks [3].
The International Organization for Standardization gives guidance on the description of usability and developed the international standard ISO 9241 defining usability as the extent to which a product can be used by specified users to achieve specified goals effectively, efficiently, and satisfactorily in a specified context of use [4]. This implies that knowledge of a system's users

is crucial in order to be able to develop usable platforms. Thus, user characteristics such as age, gender, and technology expertise must be taken into account [5]. With regard to users' expertise, in the sense of both general computer aptitude and application familiarity [6], research has already pointed out that users' IT background should be considered in usability tests [7] because analyzing the performance of, for instance, novice and expert users provides deeper insights [8]. However, this is hardly included in usability testing [9]. Keeping these issues in mind, the present study follows the design science research methodology [10, 11] which offers systematic and practical guidelines for building innovative information systems artifacts in order to solve a problem in an organized and effective manner [12]. Design science research distinguishes artifacts on different levels of abstraction, ranging from highly abstract theories to very concrete IT artifacts with only a small degree of abstraction. Though, all types of artifacts – regardless of their abstraction level – are considered as factors for valuable contributions [10].
In this research, two artifacts with different levels of abstraction are investigated: (1) an optimized method for usability testing and (2) a fully functional software service for delivering digital textbooks to around 250,000 potential users with heterogeneous IT background. Hence, the focus of our research is the (whole) design cycle which lies at the core of each design science research project. This iterative process between generating and evaluating artifacts aims to refine and improve a design until a satisfactory level is reached [13]. Thus, our second artifact – the design of an IT artifact – is subject to an empirical evaluation of the proposed usability evaluation method which forms our first artifact. The study aims to address the following research questions:
(1) Is usability evaluation beneficial to design and redesign a software service for digital textbooks?
(2) Is it possible to optimize the methods used in usability evaluation from an effectiveness and efficiency point of view?
(3) Do users with diverse technology expertise encounter different usability flaws?
To the best of our knowledge, this is the first

URL: <http://hdl.handle.net/10125/41164>
ISBN: 978-0-9981331-0-2
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Digi4School – Demo

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1 That's me

Speaking

Introducing a person

Interview your partner. Use the questions from the VocabBooster and take notes. Then introduce your partner to another classmate. Use the phrases from the LanguageBox. Mind the tenses.

VocabBooster

What do you do? ■ How old are you? ■ Where do you live? ■ How long have you been studying English? ■ What are you going to do in the next summer holidays? ■ What do you like doing in your free time? ■ What do your parents do? ■ How much pocket money do you get? ■ Have you got any siblings? ■ How much time do you spend studying for school? ■ Where did you go to school before? ■ What are your favourite subjects? ■ Why did you decide to go to a commercial college? ■ What is your mobile phone number? ■ What social networks are you on? ■ What is your favourite movie / band / series?

Please note:

- "0" is pronounced "oh".
- Double digits (such as 44) in telephone numbers or bank accounts can be pronounced "double four".

LanguageBox

May I introduce you to ...
He/She is a student at the ...
... is ... years old and lives in ...
He/She has been studying English for ... years.
In the next summer holidays he/ she is going to ...
In his/ her free time he/ she likes doing sports/ playing football/ socialising with friends ...
His/ Her parents are ...
He/ She gets ... a month/ a week.
... does not get any pocket money.
He/ She has got ... siblings./ He/ She does not have any siblings.
He/ She usually studies for ... hours a week for school.
He/ She attended a general secondary school/ new secondary school/ lower level academic secondary school.
His/ Her favourite subjects are ...
He/ She decided to go to this school because he/ she is interested in ...
His/ Her mobile phone number is ...
He/ She is on ... (name of social network)
His/ Her favourite movie/ band / series is ...

Unit 1

Markierungen

15

You

<input type="checkbox"/> bossy	<input type="checkbox"/> friendly
<input type="checkbox"/> optimistic	<input type="checkbox"/> helpful
<input type="checkbox"/> sensitive	<input type="checkbox"/> anxious
<input type="checkbox"/> moody	<input type="checkbox"/> curious
<input type="checkbox"/> sensible	<input type="checkbox"/> talkative
<input type="checkbox"/> shy	<input type="checkbox"/> lazy

Your partner

<input type="checkbox"/> bossy	<input type="checkbox"/> friendly
<input type="checkbox"/> optimistic	<input type="checkbox"/> helpful
<input type="checkbox"/> sensitive	<input type="checkbox"/> anxious
<input type="checkbox"/> moody	<input type="checkbox"/> curious
<input type="checkbox"/> sensible	<input type="checkbox"/> talkative
<input type="checkbox"/> shy	<input type="checkbox"/> lazy

Compare your results with your partner.

Appearances

VocabBooster					
Eyes	Hair	Nose	Face	Body	Height
blue	dark	long	round	slim	tall
green	blonde	short	oval	thin	short
brown	light-brown	straight	pale	well-trained	medium-height
hazel	brunette	snub nose	tanned	overweight	huge
grey	ponytail	pointed	freckles	skinny	petite
glasses	bald	flat	beard	obese	average
beady	straight	upturned	moustache	athletic	
clear	curly			muscular	
heavy-lidded	wooly			bony	
dead	short/long				

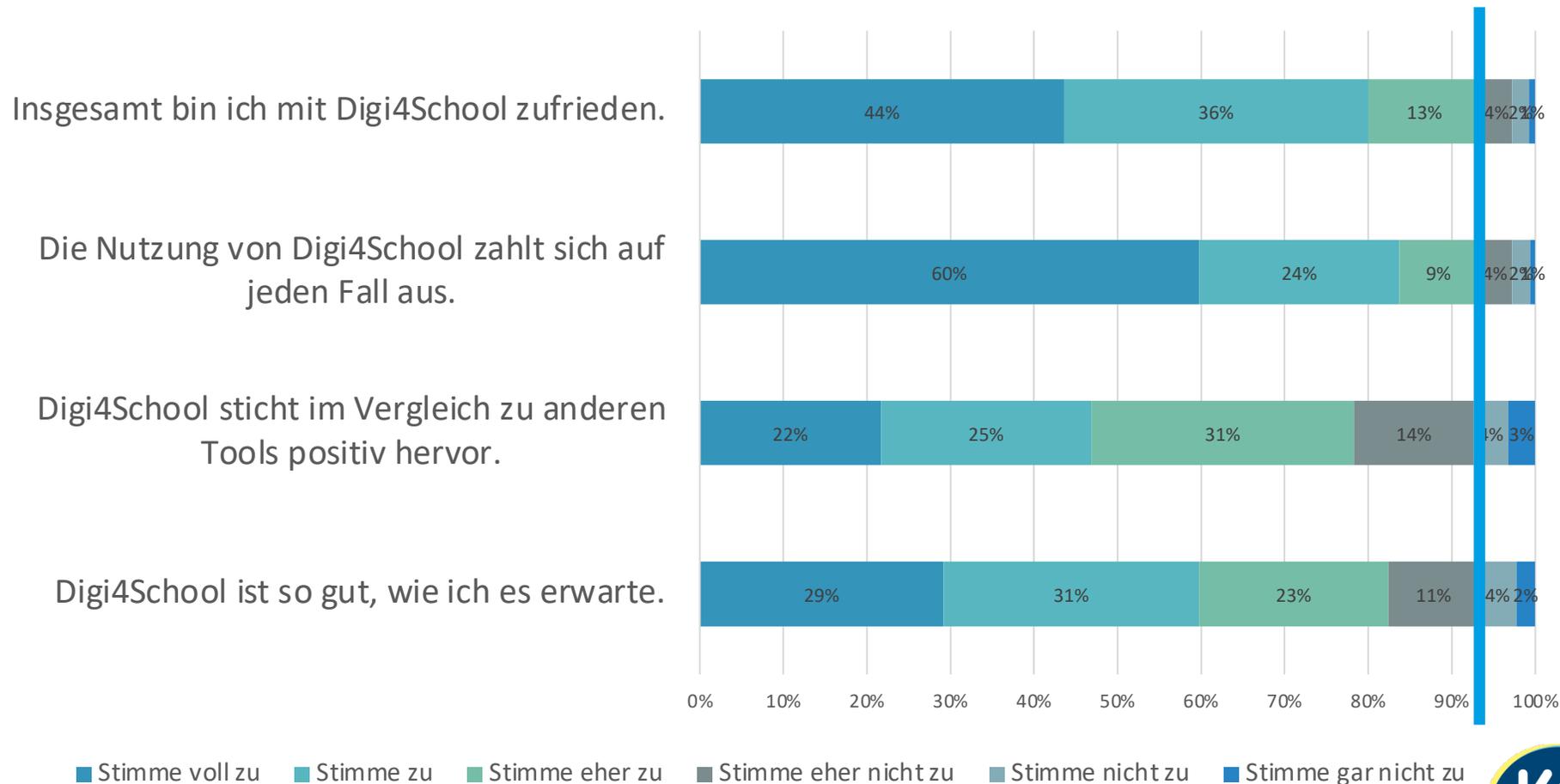
Complete the sentences in a suitable way. Use the words from the VocabBooster. Sometimes there is more than one possibility.

- Tina has got brown _____.
- She has got a very pale _____.
- The twins have both got dark, curly _____.
- I would say that her _____ nose makes her look really sweet.
- My boyfriend has got a very muscular _____.
- Both men were very well-_____.
- My parents are rather short but nevertheless I am medium-_____.
- I got nicely _____ from so much exposure to the sun during my last summer holidays.

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5

Digi4School – User Feedback

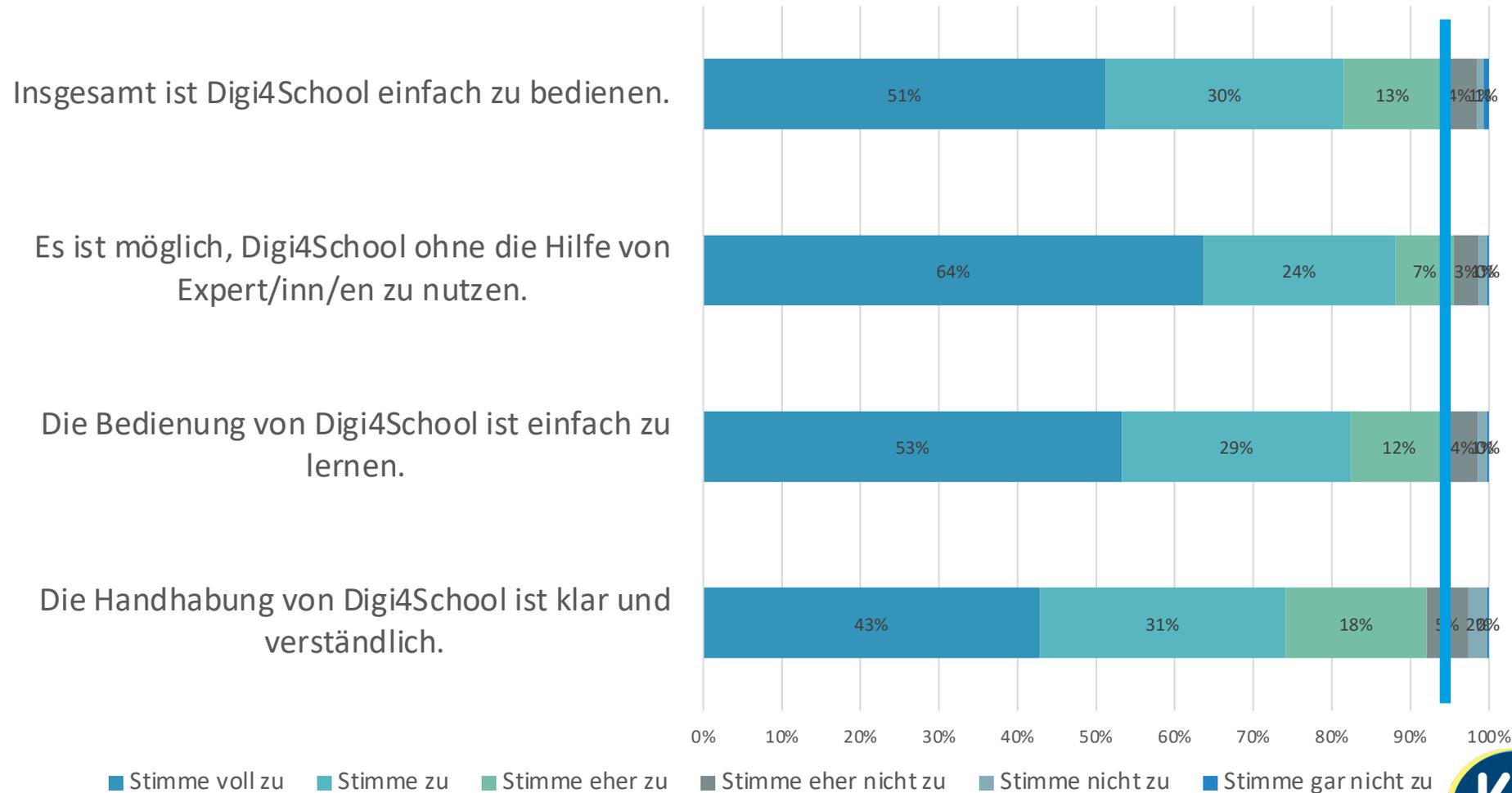
Very high level of satisfaction with the service



N=4.325 n=830 (19%)

Digi4School – User Feedback

Extremely high usability ratings



N=4.325 n=830 (19%)

Thank You!



Knowledge Markets

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