

# EFFECTIVENESS OF OER USE IN STUDENTS' MATHEMATICAL OUTCOMES: A CASE STUDY IN CHILE TO PROMOTE OER POLICY

Westermann, W.;

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# Cape Town Open Education Declaration



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# Effectiveness of OER use in students' mathematical outcomes: A case study in Chile *to promote OER Policy*

***Werner Westermann J.***

**Open Education Global Conference**

Cape Town 2017



# Research on Open Educational Resources for Development in the Global South

## GENERAL OBJECTIVE:

IMPROVE EDUCATIONAL POLICY, PRACTICE and RESEARCH in developing countries by better understanding the use and impact of OER

August 2013 - February 2017

### PROJECT CLUSTERS

- OER Desktop Review
- OER Survey
- Academics' adoption of OER
- Teacher educators' adoption of OER
- OER adoption in one country
- OER impact studies
- Baseline educational expenditure



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created by Rondine Carstens and the ROER4D team

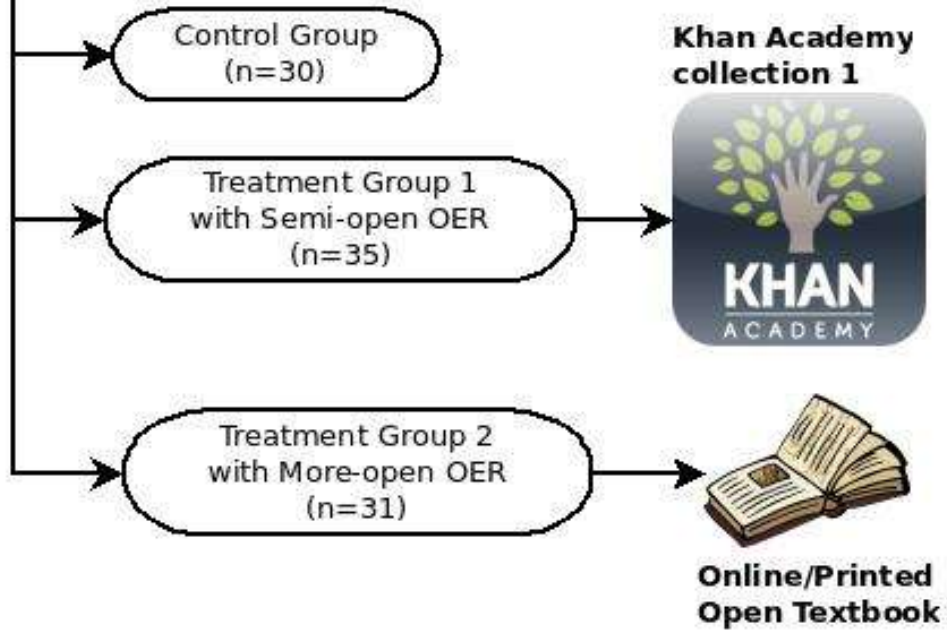


# Rationale Sub-Project 9

- OER Adoption looking to assess its Effectiveness
  - Student 1st year Outcomes (performance)
  - Very low retention (46%)
  - Lack of basic knowledge and academic skills
    - No prerequisite to enroll
    - Very low socio-demographic profile
- Mixed methodology approach
  - Quantitative
  - Qualitative
    - Focus groups with Students / Interview with teachers
    - Survey to students

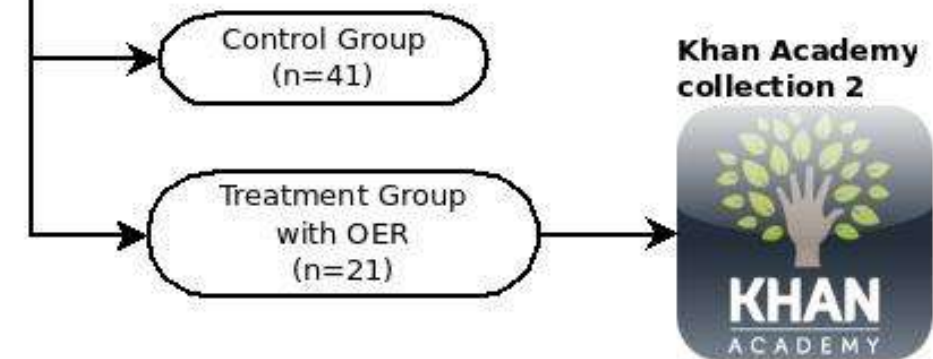
**Scenario 1:  
Contact mode**

**School of Education**  
**Courses: Arithmetics (2nd Semester, 1st Year)**  
**Teacher 1: Rebeca Parra**



**Scenario 2:  
e-Learning mode**

**School of Engineering**  
**Courses: Algebra (1st Semester)**  
**Calculus (2nd Semester)**  
**Teacher 2: Celso Soto**





# OER Selection

- Khan Academy
  - Extensive in resources and content
  - “Mentor” creates a “Course” selecting and sequencing resources to enrolled students (Remix)
- Open Textbook
  - Created by the teacher’s notes/resources
  - Hosted in Wikiboks
  - Printed copy from day 1

- ALGEBRA (Clon)
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  - Evaluación de Saberes Previo
  - Mi Sala Virtual
- Instructivo Khan Academy
  - Introducción
  - Crear Cuenta Gmail
  - Primer Ingreso a Khan Ac
  - Interactuando en Khan Ac
- Módulo 0: Conocimientos Pre
  - Clase 1
    - Contenidos de la Clase
    - Más ejercicios y activi
      - Números naturale
      - Números prim**
      - El orden de las
    - Propiedades aritm
  - Clase 2
  - Clase 3
  - Clase 4
- Módulo 1: Conjuntos

## ÁLGEBRA

### NÚMEROS NATURALES

Números primos:

VER EN :  **KHANACADEMY**



# Conclusions

- Contact Mode students that used a **Khan Academy** (Treatment Group 1) obtain significantly **better exam grades** than students:
  - that did not use any extra resource (Treatment Group 2)
  - that used an open textbook as an extra resource (Control Group)
- Contact Mode students that used **Khan Academy** have significantly **less attendance** levels than other examined students
- No significant effectiveness of Khan Academy

# Case 1

- Enlaces, Chilean Ministry of Education ICT program for K-12 schools
- **“Pedagogical Integration Models”**: personalized, web-based content/assessment platforms for Math and English
- Third- to eighth-grade students (nearly 190.000, 5%) in public-funded schools (nearly 1.450, 12%)
- USD\$ 2 million, cost mostly related to proprietary individual licenses of the user-subscription web service

# Case 1

- Evaluation Report findings:  
[http://historico.enlaces.cl/tp\\_enlaces/portales/tpe76eb4809f44/uploadImg/File/2014/documentos/modelos/InformeFinal\\_Modelos.pdf](http://historico.enlaces.cl/tp_enlaces/portales/tpe76eb4809f44/uploadImg/File/2014/documentos/modelos/InformeFinal_Modelos.pdf)
- Use in hours of the platforms, in both English and Math, analysis disaggregated by type of platform and month, reported that use by students was **near zero**.
- Correlation between the subject, in both English and Math, and the standardized national tests was also **close to zero**.
- Accessibility issues because **not being enough licenses** led to:

# Case 1

- Programme ceased operations at the beginning of the 2014 school year
- Should the Ministry consider a no-cost alternative, high quality, award-winning OER platform like the Khan Academy, which guarantees permanent online access to **every student in Chile?**
- Can the investment be directed towards the **process of adopting and appropriately using** OER, mainly by teachers and learning supporters, but also by parents and guardians, instead of spending on expensive “per-seat”

# Case 2

- Textbook program, Ministry of Education spends each year USD\$ 40 Million
  - 2 foreign companies dominate 80% of public market
  - Bids integrate Production-Printing-Distribution
- Quality, Format and Market of Textbooks (Ortuzar, 2014) <http://www.ieschile.cl/wp-content/uploads/2011/07/Informe-Textos-escolares.pdf>
  - public and private marketplace did not encourage competition for better quality content and products:
    - lower printing costs in order to win public contract bids
    - "incentives" to local authority and school managers to require textbooks of an specific year or edition

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    - "incentives" to local authority and school managers to require textbooks of an specific year or edition
    - same contents were reused repeatedly in both public and private markets



# Case 2

- Previous studies around the poor quality and limited use of textbooks in schools in last two decades
- Quality shortcomings concerned substantial features of a textbook:
  - limited and irrelevant information
  - poor clarification of objectives
  - reduced uptake by the authors of the contributions of current and innovative pedagogy and fundamental aspects of the discipline involved
  - neglected details of presentation, planning and sequences
  - scant regard for users

# Case 2

- Can openness contribute a solution to fixing the **broken public and private textbook market** in Chile and **strengthening competitiveness**, particularly in the **promotion of the local/national publishing industry?**
- Can openness provide a setting for incremental **quality improvement** of key learning resources, as well have **high return on public investment?**
- Yes!! Let's Go Open!!