Pre-analysis Plan

Showing Life Opportunities: Take-up Interventions in the National Level (Coastal Regime)

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Asanov, Igor and David McKenzie. 2020. "Scaling up virtual learning of online learning in high schools." AEA RCT Registry. June 10. https://doi.org/10.1257/rct.5982-1.0.

Introduction

Due to the Covid-19 outbreak remote-learning programs become a part of the educational strategy (UNESCO, 2020). The challenge is to ensure take-up of the programs from home. We provide a series of experiments to learn iteratively how to improve the educational process. This pre-analysis plan focuses on a rapid analysis of light touch interventions to improve take-up that we were introduced in Ecuador for the "Showing Life Opportunities" project during September-November 2020 in schools of Coastal Educational Regime, Ecuador. It is intended to outline our analysis in a first pass through the data.

Description of the National Level Program "Showing Life Opportunities"

As a rapid-fire response to the challenges of the COVID-19 outbreak we, in collaboration with the Ministry of Education of Ecuador, provide online courses in schools on the national level (highlands and coastal educational regimes) in Ecuador for the students of grade K12 (last year of school). The first set of interventions were introduced for the schools in the Highlands educational regime from May to June 2020 and the pre-analysis plan is reported in the separate document.[1] In this document we focus on the set of interventions provided from September to November 2020 in Coastal educational Regime.

Apart from the take-up interventions in the coastal educational regime, we assess the effect of the courses by randomizing 598 schools to one of the following six treatment groups:

1) Role Model videos and treatment courses (Personal initiative and Negotiations)
2) Placebo videos and treatment courses (Personal initiative and Negotiations)
3) Role Model videos and placebo courses 1 (Spanish and Statistics)
4) Placebo videos and placebo courses 1 (Spanish and Statistics)
5) Role Model videos and placebo courses 2 (Spanish and English)
6) Placebo videos and placebo courses 2 (Spanish and English)

[1] Pre-Analysis Plan Take Take-up Interventions in the National Level (Highlands Regime) 23 July 2020 MD5: 227c56dba77ca959f1245f82c19e5e2e SHA1: a7825da2e4497d537a1d8ef43eb7d7702d75cd12 Uploaded At: July 23, 2020

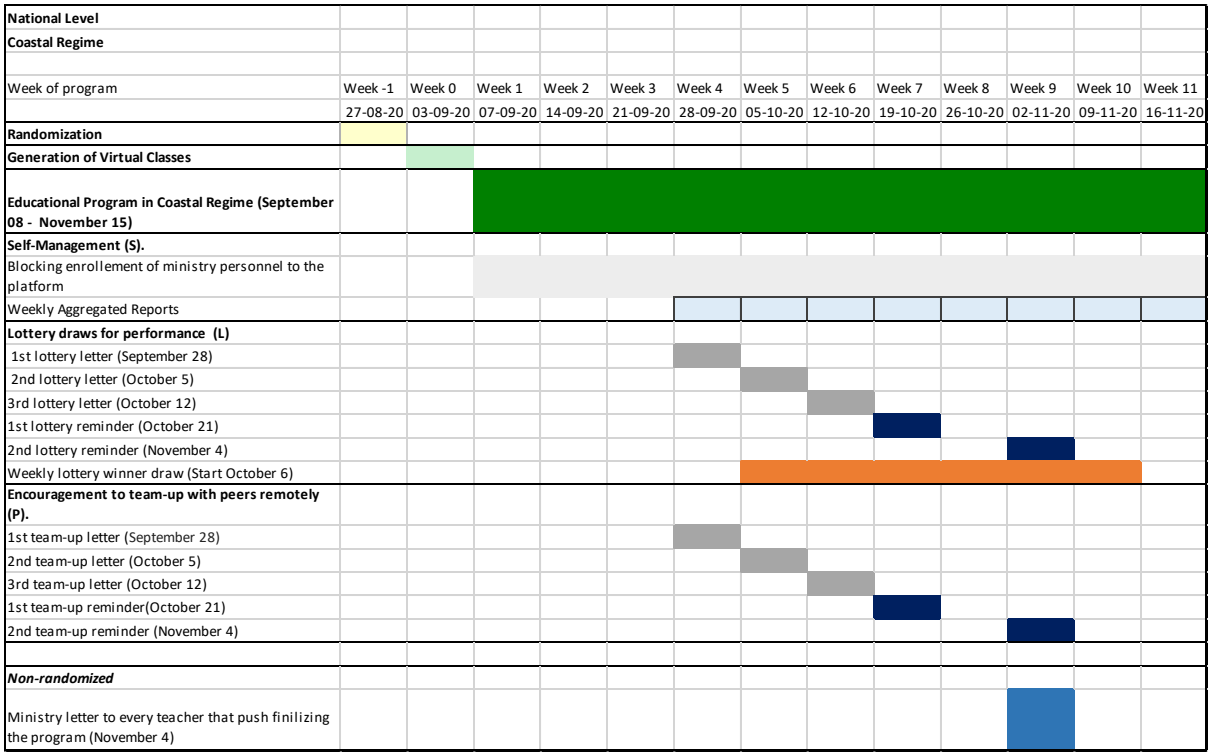
Interventions to increase take-up.

We provide 4 interventions on the school level to change take-up:

1. Control. Business as usual.
2. Self-Management (S). Based on the experience with the program in the Highlands regime and qualitative interviews with Ministry personnel we assume that management system that we provide is helpful in increasing take-up. Thus, we exclude schools in this treatment arm from this monitoring system to assess performance without the central management system at place. Specifically, we do not enrol ministry personal (head of zones, central office of the ministry) to the online management system that shows real-time information about the activity on the educational platform and do not provide weekly take-up reports for those schools with completion rate and benchmarking information within the educational zone (see appendix A1 for further details).
3. Lottery draws for performance (L). Students earn a ticket for a lottery prize for each completed module and performance on platform. We send 3 waves of emails to students informing them that more lessons they complete and better their score on the platform more chances they have to win the lottery ticket with weekly draw of a winner. We focused not only on completion rate, but also incentivized performance on the platform (score) as we learnt from highlands regime take-up interventions that lottery increase take-up, but does not seem to result in better performance on knowledge tests. We made a lottery draw each week of one winner per school and inform these winners to increase positive spillovers of lottery within treated schools (We also write to the winners that they also can win next week). Finally, we send two reminders about participation in lottery (for ~24% of randomly selected students we send placebo reminders that did not contain information about lottery). See appendix A2 for further details about information in letters.
4. Encouragement to team-up with peers remotely (P). Students are encouraged to remotely team-up with peers to complete the program and get better score. We send 3 waves emails to encourage work with peers to complete as many lessons as possible and get better score. Finally, we send two reminders about encouragement to team-up with peers remotely (for ~24% of randomly selected students we send placebo reminders that did not contain information about teaming-up). See appendix A3 for further details about information in encouragement to team-up with peers remotely.

Figure 1 depicts timeline of the program and each take-up treatment. Right before the end of the program, Ministry of education send the administrative letter ("nudge") to the personnel involved in the program irrespective of treatment assignment asking to finish the program before deadline (15th of November). See appendix A4 for the letter.

Figure 1. Timeline of the Coastal educational regime program and take-up interventions



Randomization

Randomization was done on the school level among 598 schools. First, we randomly selected 588 schools. Out of those 588 schools, we form 49 strata of 12 comparable schools and then randomly assigned three schools to control, three to Monitoring System (M), three to Monitoring System + lottery reminder to students (L), and three to Monitoring System + encouragement to team-up with peers remotely (P) within each strata. We use the following variables to calculate the Mahalanobis distance between all pairs of schools: Treatment status on the type of the course assigned, Educational zone, cluster size (number of students according to administrative records in school), students average performance on the state exam in the school (SER Bachiller), number of students in the 12th grade. We use the optimal greedy algorithm to form strata of 12 comparable schools based on the calculated Mahalanobis distance between schools, then we randomize within those strata. [2] Secondly, for the other randomly selected 10 schools we use simple randomization and assign three schools to control, two to Monitoring System (M), two to Monitoring System + lottery reminder to students (L), and three to Monitoring System + encouragement to team-up with peers remotely (P).

[2] We use R package blockTools to form strata of 12 (Moore, Ryan T. , 2016).

HYPOTHESES TO BE TESTED

We will test hypotheses in four domains. In the domain 1 we will test hypothesis on the class level. In the domain 2,3,4 on the individual (student) level. We will test the outcomes on the week 8 (before the ministry letter) and also in the week 11 (after the ministry letter).

The domains are next:

Domain 1: Coverage of the program

Hypothesis: Take-up treatment groups compared to business as usual group change coverage of the program.

1. **Active class** – activeclass – dummy variable that is 1 if at least one student started at least one lesson in the class.
2. **Number of active students in class** – numberstudents – number of active students per class on the platform.[3]
3. ***Coverage index*** – average standardized z-score of outcomes 1 to 2.

Domain 2: Take-up of the program

Hypothesis: Take-up treatment groups compared to business as usual group result in change in studying behavior.

1. **Time in minutes on the platform** – timeinminutes (values will be winsorized at the 99th percentile)
2. **Active days on the platform** –activedays
3. **Lesson completed –** lessons_completed
4. ***Main Take-up index*** – average standardized z-score of outcomes 1 and 2.

Domain 3: Performance at the program

Hypothesis: Take-up treatment groups compared to business as usual group change performance during the program.

1. **Performance on the lessons** – score – standardized z-score of sum of lessons scores on the platform
2. **Business project submitted** – project_submitted - dummy that is equal to 1 if student submitted the project
3. **Performance index** - average standardized z-score of outcomes 1 and 2.

Domain 4: Performance in the knowledge test

Hypothesis: Take-up treatment groups compared to business as usual group change performance on the knowledge test.

We define it as the z-score of performance of student on subject specific tests:

1. **Personal initiative** - z-score based on variables from endline knowledge test from 2_4_1_E to 2_4_9_E.

[3] We will use proportion of students per class instead of the number active students in class (Number of active students in class divided by number of students in class according to administrative records), if we receive reliable administrative data on the number of students per class.

2. **Negotiations** - z-score based on variables from endline knowledge test from 2_5_1_E to 2_5_11_E;
3. **Statistics and scientific thinking** - z-score based on variables from endline knowledge test from 2_1_1_E to 2_1_20B_E;
4. **Spanish literacy** - z-score based on variables from endline knowledge test from 2_2_1_E to 2_2_8f_E;
5. **English Literacy** -- z-score based on variables from endline knowledge test from 2_3_1_E to 2_3_8f_E;

6. ***Knowledge index*** **-** Average of standardized z-scores of outcomes 1 through 5. The knowledge tests are given to students at the end survey through the online platform. The information is collected for all treatment groups.

We create an average z-score index, calculating the z-score of each variable by subtracting the control-group mean and dividing by the control group standard deviation, and averaging the z-scores of the outcomes for each family.

General Estimation Strategy

In domain 1 we will use the following specification for class *c* from the school *j* to estimate the impact of the interventions relative to control group:

$$Y_{c,1} = \beta_0 + \beta_S S_J + \beta_L L_J + \beta_P P_J + controls_{c,j} + Strata'_{k,j}\,\Theta + \varepsilon_{c,j}$$

And in domains 2,3,4 for student *i* from the school *j*:

$$Y_{i,1} = \beta_0 + \beta_E S_J + \beta_M L_J + \beta_M P_J + controls_{c,j} + Strata'_{k,j}\,\Theta + \varepsilon_{c,j}$$

In these specifications $Y_{c,1}$ and $Y_{i,1}$ is the variable measures the outcome of interest for class *c* and student *i,* respectively. The treatment variable S is the dummy variable that equals 1 for the self-managed schools. The treatment variable L is the dummy variable that equals 1 if students in the schools covered by lottery intervention. The treatment variable P is the dummy variable that equals 1 if students in the schools encouraged to team-up with peers. We will use the post-double-selection Lasso approach of Belloni et al. (2014) to school, class control variables from baseline taken from the administrative information (see Appendix B1). $Strata'_{k,j}$ is a vector of randomization strata dummy variables, and $\varepsilon_{i\,j}$ is the error term, which we will cluster at the school level.

To estimate the effect in more precise way for the lottery (L) and encouragement to team-up (P) treatments, where baseline values are recorded on the platform before the intervention we will use ANCOVA specification. Namely, in domain 1 we will use the following specification for class *c* from the school *j* to estimate the impact of the interventions relative to control group:

$$Y_{c,1} = \beta_0 + \beta_L L_J + \beta_P P_J + Y_{c,0} + controls_{c,j} + Strata'_{k,j}\,\Theta + \varepsilon_{c,j}$$

And in domains 2,3,4 for student *i* from the school *j*:

$$Y_{i,1} = \beta_0 + \beta_M L_J + \beta_M P_J + Y_{i,0} + controls_{i,j} + Strata'_{k,j}\,\Theta + \varepsilon_{c,j}$$

We will use the post-double-selection Lasso approach of Belloni et al. (2014) to class, student control variables from baseline taken from the administrative information (see Appendix B1) and recorded on platform before intervention on 28th of September (see appendix B2).

Capturing time-specific effects

As we anticipate the change in the effect of the intervention over time, we will assess the treatment effects in time with help of panel data analysis using weekly performance on outcomes from domain 1 to 3 for the period of interventions (7th of September-16th of November).

Multiple Hypothesis Testing

We rely on two approaches to deal with multiple hypothesis testing. We define summary index measures, and can then consider a single summary measure per domain. Second, we will also calculate Romano-Wolf stepdown p-values to correct for multiple hypothesis testing.

Attrition.

We are less concerned about the attrition for the coverage and take-up of online program (domain 1 and 2). However, we anticipate attrition issues on the performance on the platform and the endline knowledge tests (domain 3 and 4).[4] Thus, we will use next strategy to understand if observed

[4] Note that particularly the self-management treatment (S) and encouragement to team-up with peers remotely (P) treatment likely to change number of students on the platform.

performance of students is driven by selection due the take-up interventions or take-up intervention lead to better performance.

First, we will identify the overall attrition rate in the sample and the reasons for this attrition: (a) missing due to the drop-out from school/program and (b) failure to code the values due to the technical problems. Second, we will determine if the attrition in the treatments and comparison independent from the treatment.

If non-response rates are less than 5% and attrition is independent of treatment, we will assume data are missing-at-random and not carry out any imputation. If treatment status does have a statistically significant effect on survey attrition or attrition is higher than 5%, we will test the of our results in domain 3 and 4 using Lee bounds (Lee, 2009) and provide estimation, with inputted data from baseline for variables present in the baseline for the treated.

Estimating heterogeneous treatment effects

We will use next strategies to understand heterogeneous treatment effects. For the lottery draws for performance (L) and encouragement to team-up with peers remotely (P) compared to control treatments, we will estimate probability to achieve an outcome of interest based on baseline characteristics using method proposed by Abadie, Chingos, and West (2018). Additionally, we want to assess heterogeneous treatment effects according to the following two baseline dimensions:

(1) Gender: Male/ Female

Hypothesis: The treatments have a different effect on boys and girls.

(2) Wealth level

Hypothesis: The treatments have a different effect depending on the wealth level

We will apply the same procedure comparing self-management and control treatment for those domains, where baseline characteristics are independent from treatment.

References

Abadie, A., Chingos, M.M. and West, M.R., 2018. Endogenous stratification in randomized experiments. *Review of Economics and Statistics*, 100(4), pp.567-580.

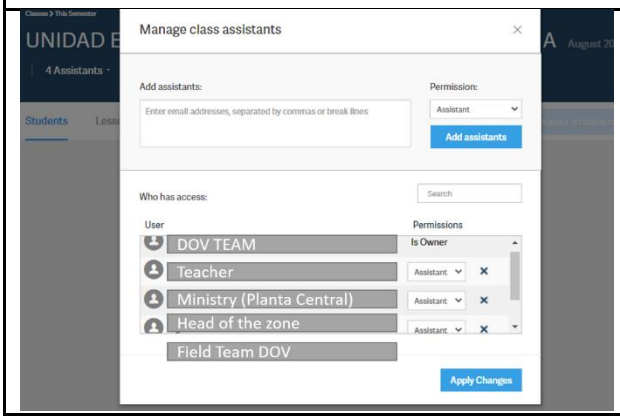
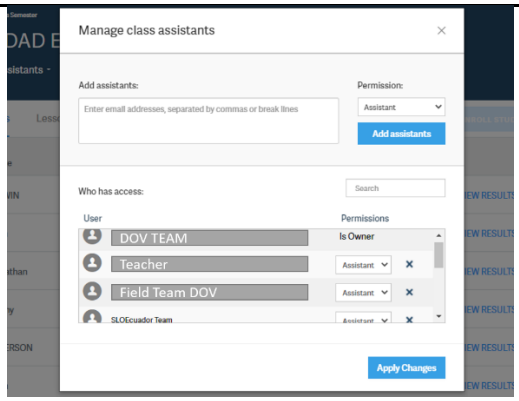
Belloni, Alexandre, Victor Chernozhukov, and Christian Hansen (2014) "High-Dimensional Methods and Inference on Structural and Treatment Effects." *Journal of Economic Perspectives* 28 (2): 29-50.

Lee, D. S. (2009). Training, wages, and sample selection: Estimating sharp bounds on treatment effects. *Review of Economic Studies*, *76*(3), 1071–1102. https://doi.org/10.1111/j.1467-937X.2009.00536.x

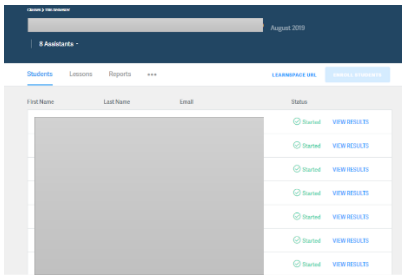
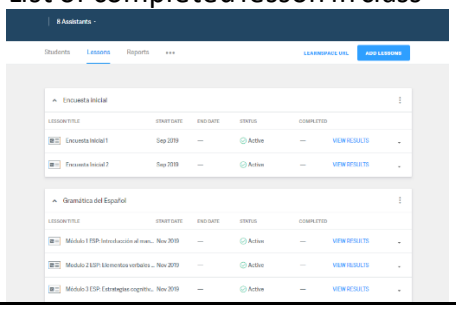
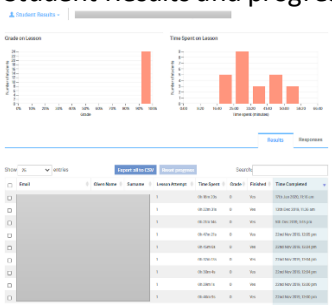
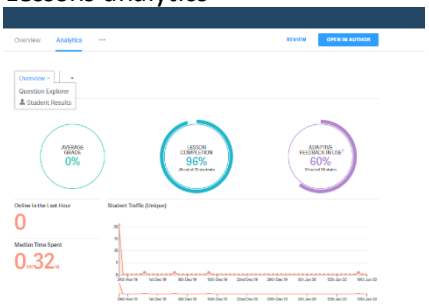
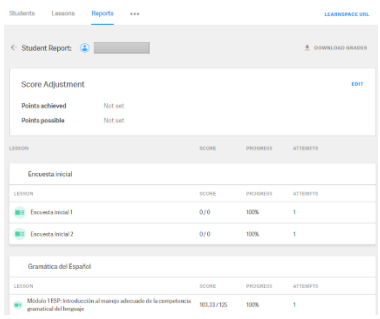
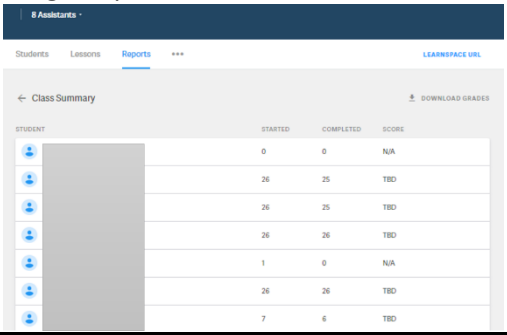
UNESCO (2020), https://en.unesco.org/news/dealing-obstacles-distance-learning accessed 20 Nov 2020

Appendix A.

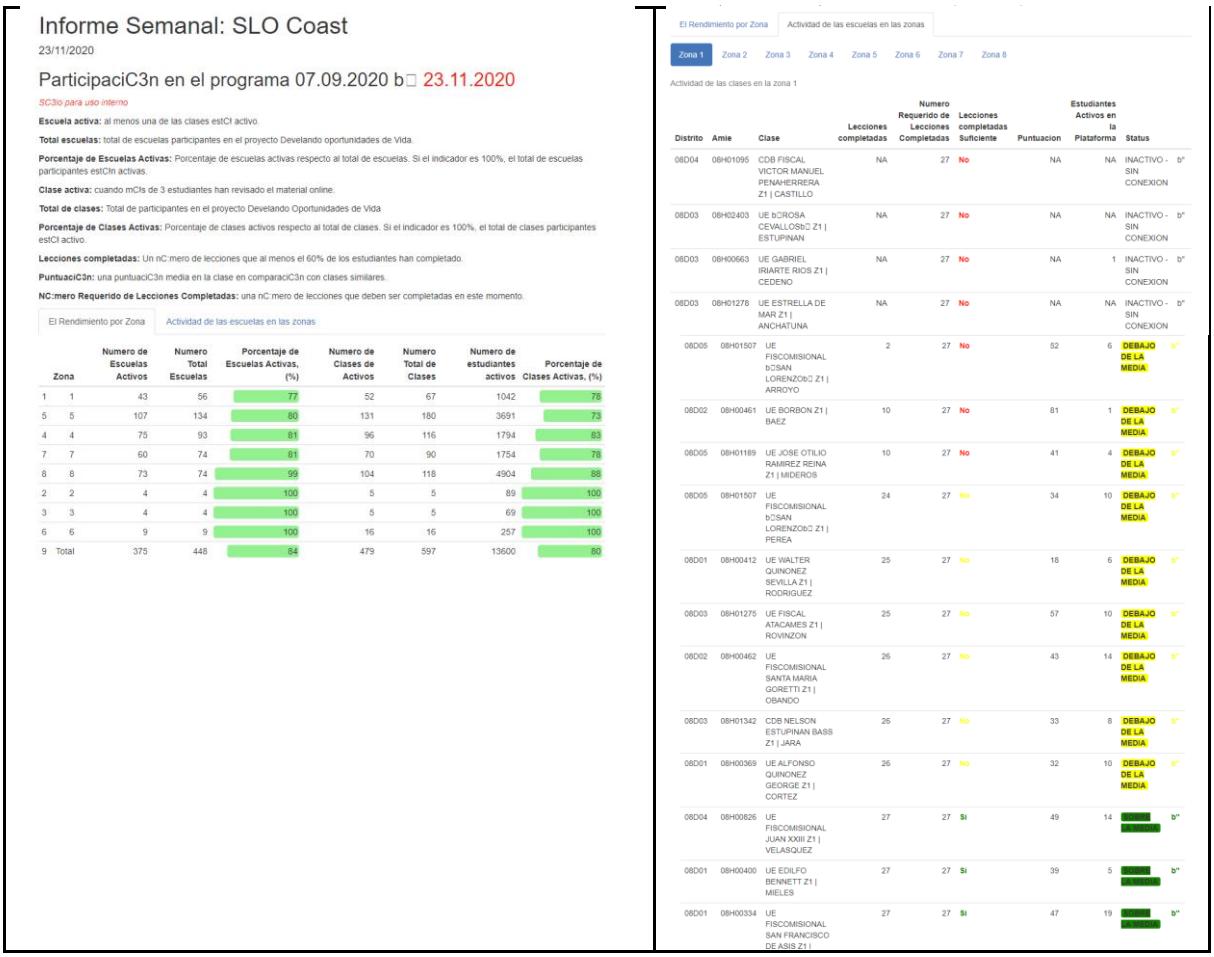
Appendix A1. Monitoring system and weekly reports.

Control. Business as usual	Self – Management (S)
	

In the control condition (business as usual) the ministry personnel (head of the educational zone, central office) is enrolled in each class, but in the self-management not. Thus, the ministry person nel do not see the information about performance of classes and students such as next:

List of enrolled students in class	List of completed lesson in class
	
Student Results and progress	Lessons analytics
	
Individual student progress	Progress per student in class
	

In addition, we do not provide next weekly aggregated information per class for those schools/classes:



Informe Semanal: SLO Coast

23/11/2020

ParticipaciC3n en el programa 07.09.2020 b□ 23.11.2020

SC3io para uso interno

Escuela activa: al menos una de las clases estCI activo.

Total escuelas: total de escuelas participantes en el proyecto Develando oportunidades de Vida.

Porcentaje de Escuelas Activas: Porcentaje de escuelas activas respecto al total de escuelas. Si el indicador es 100%, el total de escuelas participantes estCIn activas.

Clase activa: cuando mCIs de 3 estudiantes han revisado el material online.

Total de clases: Total de participantes en el proyecto Develando Oportunidades de Vida

Porcentaje de Clases Activas: Porcentaje de clases activos respecto al total de clases. Si el indicador es 100%, el total de clases participantes estCI activo.

Lecciones completadas: Un nC:mero de lecciones que al menos el 60% de los estudiantes han completado.

PuntuaciC3n: una puntuaciC3n media en la clase en comparaciC3n con clases similares.

NC:mero Requerido de Lecciones Completadas: una nC:mero de lecciones que deben ser completadas en este momento.

El Rendimiento por Zona | Actividad de las escuelas en las zonas

	Zona	Numero de Escuelas Activos	Numero Total Escuelas	Porcentaje de Escuelas Activas, (%)	Numero de Clases de Activos	Numero Total de Clases	Numero de estudiantes activos	Porcentaje de Clases Activas, (%)
1	1	43	56	77	52	67	1042	78
5	5	107	134	80	131	180	3691	73
4	4	75	93	81	96	116	1794	83
7	7	60	74	81	70	90	1754	78
8	8	73	74	99	104	118	4904	88
2	2	4	4	100	5	5	89	100
3	3	4	4	100	5	5	69	100
6	6	9	9	100	16	16	257	100
9	Total	375	448	84	479	597	13600	80

El Rendimiento por Zona | Actividad de las escuelas en las zonas

Zona 1 | Zona 2 | Zona 3 | Zona 4 | Zona 5 | Zona 6 | Zona 7 | Zona 8

Actividad de las clases en la zona 1

Distrito	Amie	Clase	Lecciones completadas	Numero Requerido de Lecciones Completadas	Lecciones completadas Suficiente	Puntuacion	Estudiantes Activos en la Plataforma	Status
08D04	08H01095	CDB FISCAL VICTOR MANUEL PENAHERRERA Z1 | CASTILLO	NA	27	No	NA	NA	INACTIVO - SIN CONEXION
08D03	08H02403	UE b□ROSA CEVALLOSb□ Z1 | ESTUPINAN	NA	27	No	NA	NA	INACTIVO - SIN CONEXION
08D03	08H00663	UE GABRIEL IRIARTE RIOS Z1 | CEDENO	NA	27	No	NA	1	INACTIVO - SIN CONEXION
08D03	08H01278	UE ESTRELLA DE MAR Z1 | ANCHATUNA	NA	27	No	NA	NA	INACTIVO - SIN CONEXION
08D05	08H01507	UE FISCOMISIONAL b□SAN LORENZOb□ Z1 | ARROYO	2	27	No	52	6	DEBAJO DE LA MEDIA
08D02	08H00461	UE BORBON Z1 | BAEZ	10	27	No	81	1	DEBAJO DE LA MEDIA
08D05	08H01189	UE JOSE OTILIO RAMIREZ REINA Z1 | MIDEROS	10	27	No	41	4	DEBAJO DE LA MEDIA
08D05	08H01507	UE FISCOMISIONAL b□SAN LORENZOb□ Z1 | PEREA	24	27	No	34	10	DEBAJO DE LA MEDIA
08D01	08H00412	UE WALTER QUINONEZ SEVILLA Z1 | RODRIGUEZ	25	27	No	18	6	DEBAJO DE LA MEDIA
08D03	08H01275	UE FISCAL ATACAMES Z1 | ROVINZON	25	27	No	57	10	DEBAJO DE LA MEDIA
08D02	08H00462	UE FISCOMISIONAL SANTA MARIA GORETTI Z1 | OBANDO	26	27	No	43	14	DEBAJO DE LA MEDIA
08D03	08H01342	CDB NELSON ESTUPINAN BASS Z1 | JARA	26	27	No	33	8	DEBAJO DE LA MEDIA
08D01	08H00369	UE ALFONSO QUINONEZ GEORGE Z1 | CORTEZ	26	27	No	32	10	DEBAJO DE LA MEDIA
08D04	08H00826	UE FISCOMISIONAL JUAN XXIII Z1 | VELASQUEZ	27	27	Si	49	14	[redacted]
08D01	08H00400	UE EDILFO BENNETT Z1 | MIELES	27	27	Si	39	5	[redacted]
08D01	08H00334	UE FISCOMISIONAL SAN FRANCISCO DE ASIS Z1 |	27	27	Si	47	19	[redacted]

Appendix A2. Letter about participation in the lottery

Asunto: ¡Hola [nombre_estudiante]! ¡Buenas noticias! ¡Anímate a participar! - Proyecto DOV 😉

DEVELANDO OPORTUNIDADES DE VIDA

Hola [nombre_estudiante]!,

¡Felicidades! El programa DOV te ha seleccionado para participar en una lotería:

Cuantas más lecciones estudies y mejor sea tu puntuación en la plataforma, más probabilidades tendrás de recibir el premio monetario cada semana.

Recuerda:

- Haremos sorteos semanales. Tus oportunidades de ganar dependen de tu progreso semanal en la plataforma.
- Por cada lección que completes y mientras mejor sea tu puntaje, más oportunidades tendrás de ganar el premio monetario. Puedes volver a hacer una lección si quieres obtener una mejor nota - tu último intento será contado. ¡El objetivo es que aprendas todo lo que puedas!
- Asegúrate de ganar esta semana y disfruta aprendiendo tus lecciones.

!Acepten el desafío!
¡Puedes completar todas tus lecciones y aprender todo lo que puedas de las lecciones!

Atentamente,
Equipo DOV

Si tiene alguna pregunta o duda sobre el proyecto. Por favor, escribanos un correo electrónico a ecuadorslo2020@gmail.com.
Para más información

Message translated:

Subject: Hello [student_name]! Good news! Come and participate! - DOV Project 😉

Hello [student_name]!,

Congratulations! The DOV program has selected you to participate in a lottery:

The more lessons you study and the better your score on the platform, the more likely you are to receive the monetary prize each week.

Remember:

- We will make weekly draws. Your chances of winning depend on your weekly progress on the platform.

- For every lesson you complete and the better your score, the more chances you have of winning the monetary prize. You can retake a lesson if you want to get a better grade - your last attempt will be counted. The goal is for you to learn as much as you can!

- Make sure you win this week and enjoy learning your lessons.

Accept the challenge!

You can complete all your lessons and learn as much as you can from the lessons!

Yours sincerely,

DOV Team

If you have any questions or doubts about the project. Please email us at ecuadorslo2020@gmail.com.

For more information

Placebo reminder in lottery treatment:

Asunto: ¡Hola [nombre_estudiante]! Proyecto DOV 😉

DEVELANDO OPORTUNIDADES DE VIDA

Hola [nombre_estudiante]!,

¡Puedes completar todas tus lecciones y aprender todo lo que puedas de las lecciones!

Atentamente,
Equipo DOV

Si tiene alguna pregunta o duda sobre el proyecto. Por favor, escribanos un correo electrónico a ecuadorslo2020@gmail.com.
Para más información

Subject: Hello [student_name]! DOV Project 😉

Hello [student_name]!

You can complete all your lessons and learn as much as you can from the lessons!

Yours sincerely,

DOV Team

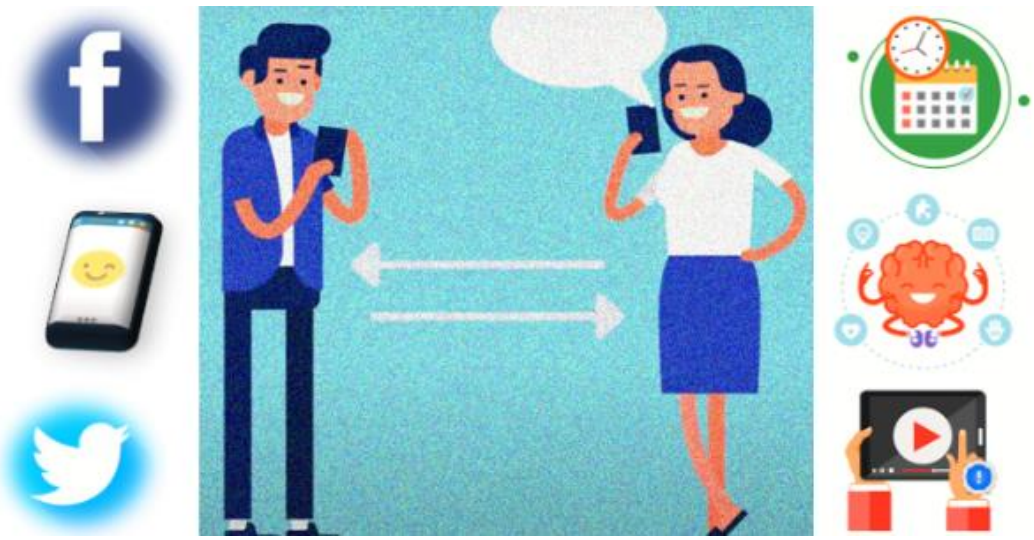
If you have any questions or doubts about the project. Please email us at ecuadorslo2020@gmail.com.

For more information

Appendix A3. Encouragement letter to team-up with peers remotely

Asunto: ¡Hola [nombre_estudiante]! ¿Aceptas el reto? ¡Anímate a participar! - Proyecto DOV 😉

DEVELANDO OPORTUNIDADES DE VIDA



Hola [nombre_estudiante]! ,

¡Felicidades! El programa DOV te ha seleccionado para que cumplas un reto:

¡Únete a un(a) compañero(a) de clase a distancia para estudiar los materiales del proyecto DOV y logra mejores resultados en tus estudios!

Recuerda, si estudian juntos pueden obtener mejores resultados en el curso.

¿Qué debo hacer?

- Comuníquense por WhatsApp, teléfono, redes sociales. Evita la interacción en persona.
- Compartan sus progresos regularmente (¡cada día!), por ejemplo, cuántas horas estudian diario, qué han aprendido, cuántas horas quieren estudiar en los próximos días.
- Ayúdense mutuamente e intenten discutir el material que encuentren especialmente interesante o desafiante.

!Acepten el desafío!
¡Juntos pueden completar todas tus lecciones y lograr los mejores resultados de aprendizaje!

Atentamente,
Equipo DOV

Si tiene alguna pregunta o duda sobre el proyecto. Por favor, escribanos un correo electrónico a ecuadorslo2020@gmail.com.
Para más información

Subject: Hello [student_name]! Will you accept the challenge? Come and participate! - DOV Project

Message translated:

Hello [student_name]!,

Congratulations! The DOV Program has selected you to meet a challenge:

Join a classmate at a distance to study the DOV project materials and achieve better results in your studies!

Remember, if you study together you can get better results on the course.

What should I do?

- Communicate by WhatsApp, phone, social networks. Avoid in-person interaction.

- Share your progress regularly (every day!), for example, how many hours you study each day, what you have learned, how many hours you want to study in the next few days.

- Help each other and try to discuss the material you find particularly interesting or challenging.

Accept the challenge!

Together you can complete all your lessons and achieve the best learning results!

Yours sincerely,

DOV Team

If you have any questions or doubts about the project. Please email us at ecuadorslo2020@gmail.com.

For more information

Placebo reminder in team-up treatment :

DEVELANDO OPORTUNIDADES DE VIDA

Hola [nombre_estudiante]!,

¡Puedes completar todas tus lecciones y lograr los mejores resultados de aprendizaje!

Atentamente,
Equipo DOV

Si tiene alguna pregunta o duda sobre el proyecto. Por favor, escribanos un correo electrónico a ecuadorslo2020@gmail.com.
Para más información

Asunto: ¡Hola [nombre_estudiante]! Proyecto DOV 😉

Hello [student_name]!

You can complete all your lessons and achieve the best learning results!

Yours sincerely,

DOV Team

If you have any questions or doubts about the project. Please email us at ecuadorslo2020@gmail. com.

For more information

Subject: Hello [student_name]! DOV Project 😉

Appendix A4. Ministry letter to finish the program (non-randomized)

COMUNICADO

QUITO, 04 DE NOVIEMBRE DE 2020

Finalización Develando Oportunidades de Vida en la Plataforma Smart Sparrow Costa 2020-2021

Los y las estudiantes que se encuentran realizando la capacitación Develando Oportunidades de Vida en la Plataforma Smart Sparrow, deberán concluir su proceso de capacitación hasta el 9 de noviembre del 2020, a partir de esa fecha los y las docentes responsables calificarán el Proyecto de Emprendimiento dentro de la plataforma. Por favor tener en cuenta los tiempos mencionados con el fin de organizar y hacer el seguimiento respectivo, debido a que la plataforma se cerrará el 15 de noviembre de 2020.

DIRECCIÓN NACIONAL DE BACHILLERATO

MINISTERIO DE EDUCACIÓN

sembramos Futuro

Lenín

Completion Showing Life Opportunities on the Smart Sparrow platform Coast 2020-2021.

Students who are taking the "Showing Life Opportunities" training on the Smart Sparrow platform must complete their training by November 9, 2020. After that date, teachers will qualify the Entrepreneurship Project within the platform. Please take into account the above mentioned times in order to organize and follow up on them, since the platform will be closed on November 15, 2020.

Appendix B1. List of control variables from administrative data

Variables at the school level		
Code		**Definition**
ZONA	Educational Zone	Factor variable corresponding to the educational zone of the school
T_School	Treatment course assigned	Factor variable: 1) Role Model videos and treatment courses 2) Placebo videos and treatment courses 3) Role Model videos and placebo courses 1 4) Placebo videos and placebo courses 1 5) Role Model videos and placebo courses 2 6) Placebo videos and placebo courses 2
TOTAL_ESTUDIANTES	School size	Number of students in school
TOTAL_ESTUDIANTES_3BT	Grade size	Number of students in the 12th grade
NOTA_SER_BACHILLER	Grade at the state exam	Average grade in school at the state exam from the last year
SECTOR	School area	Dummy variable that is equal to 1 if the school is in rural area
TOTAL_DOCENTES_EMPRENDIMIENTO	Number of teachers of entrepreneurship	Number of teachers of entrepreneurship
SOSTENIMIENTO	Type of funding of school	Dummy variable that is equal to 1 if the school is financed only from government (fiscal)
Variables at the class level		
Code		**Definition**
VERIFICATION_EMAIL	Participation of teacher verified	Dummy variable that is equal to 1 if the teacher verified by email participation in the program
RELACION LABORAL	Type of contract of teacher	Type of contract of teacher

Appendix B1. List of control variables measured on online platform

Variables at class level		
Code	**Variables at class level**	**Definition**
Class_size	Class size	Total number of active students on the platform, who have started at least one lesson.
Active_class	Active class	Classes that enroll more than 3 students on the platform and have started at least one lesson.
Variables Collected at the individual level		
Code	**Variables**	**Definition**
I_Male	Gender	A dummy for gender
I_Age	Age	Student Age
I_Language	Language	Language (Only native language; native and Spanish language; Spanish; Spanish and foreign language; Native language and foreign language).
I_10_Income	Socioeconomic characteristics	Score of possession of a washing machine, air conditioner, car, number of bathrooms, number of bedrooms, etc. Principal component.
II_1A_Entr_Attitude	Entrepreneurship attitude	Average of standardized z-scores of students`s perception of entrepreneurship (worthless /worthwhile, fun /boring, negative/positive, need/opportunity).
II_1B_Entr_Intentions	Entrepreneurial intentions	Average of standardized z-scores of student`s intention to become an entrepreneur (starting a business, have business ideas, become own boss).
II_2A_Stem_Attitude	STEM attitude	Average of standardized z-scores of student`s perception of professions in STEM (worthless/worthwhile, fun/boring, negative/positive)
II_2B_Stem_Intentions	STEM Intentions	Average of standardized z-scores of students`s intention to work in a STEM area (starting career in STEM, have ideas in STEM, become a professional in STEM).
II_Study_uni	Study at university	Dummy whether a student plans to go to university.
II_Option1, II_Option2, II_Option3	3 specializations/ options	Dummy whether a student plan to study STEM career or plan to study business (in any of 3 options).

III_Know_STEM	Know people in STEM areas	Average of standardized z-scores of whether a student knows adults who works in STEM areas: scientists, engineers, mathematicians, technologists.
III_Know_Ent	Know people in Entrepreneurship	Dummy whether a student knows adults who is Entrepreneur.
III_Expectations_5_ENT	Entrepreneurial Occupation/profession expectations – 5 years	Dummy whether a student expect to be an entrepreneur in the next 5 years. Based on classification of written answers.
III_Expectations_10_ENT	Entrepreneurial Occupation/profession expectations – 10 years	Dummy whether a student expect to be an entrepreneur in the next 10 years. Based on classification of written answers.
III_Expectations_5_STEM	STEM Occupation/profession expectations – 5 years	Dummy whether a student expect to be in STEM career in the next 5 years. Based on classification of written answers.
III_Expectations_10_STEM	STEM Occupation/profession expectations – 10 years	Dummy whether a student expect to be in STEM career in the next 10 years. Based on classification of written answers.
III_3_Entr_Success	Professional STEM/entrepreneur	Z-score of whether they can be successful as an entrepreneur.
III_3_Stem_Success	Professional STEM/entrepreneur	Z-score of whether a student believes they can be successful as a STEM professional.
III_3_Public_Success	Professional STEM/entrepreneur	Z-score of whether a student believes they can be successful as a public servant.
III_Earn_5_Years	Expectations for future earnings	How much a student expects to earn in 5 years.
III_Earn_10_Years	Expectations for future earnings	How much a student expects to earn in 10 years.
III_Salary_ecuador	Specific salary expectations	Knowledge of how much is the minimum wage per month in Ecuador.
III_Salary_ent	Specific salary expectations	Knowledge of how much an entrepreneur earn on average per month in Ecuador
III_Salary_stem	Specific salary expectations	Knowledge of how much a STEM professional (Science. Technologies, Engineering, Math) earn on average per month in Ecuador
IV_Mother_work	Parents background – mother	Dummy whether the mother is employed.
IV_Mother_profession_ENT	Parents background - mother	Dummy of profession of the mother (STEM areas)

IV_Mother_profession_STEM	Parents background - mother	Dummy of profession of the mother (entrepreneurship)
IV_Mother_edu	Parents background - mother	Education level of mother (Middle School or lower; Diploma; University Bachelors; Master degree; PhD).
IV_Mother_business	Parents background - mother	Dummy whether the mother has ever owned a business or been self-employed.
IV_Father_work	Parents background – Father	Dummy whether the Father is employed.
IV_Father_profession_ENT	Parents background - Father	Dummy of profession of the father (STEM areas).
IV_Father_profession_STEM	Parents background - Father	Dummy of profession of the father (entrepreneurship).
IV_Father_edu	Parents background - Father	Education level of father (Middle School or lower; Diploma; University Bachelors; Master degree; PhD)
IV_Father_business	Parents background - Father	Dummy whether the father has ever owned a business or been self-employed.
IV_Siblings_work	Parents background – Siblings	Dummy whether the sibling(s) is employed.
IV_Siblings_profession_ENT	Parents background - Siblings	Dummy of profession of the siblings (STEM areas).
IV_Siblings_profession_STEM	Parents background - Siblings	Dummy of profession of the siblings (entrepreneurship).
IV_Siblings_edu	Parents background - Siblings	Education level of Siblings (Middle School or lower; Diploma; University Bachelors; Master degree; PhD).
IV_Siblings_business	Parents background - Siblings	Dummy whether the siblings has ever owned a business or been self-employed.
V_Work_Experience	Working experience	Dummy whether a student has worked in a paid job or in an unpaid job.
VI_1_Attitudes	Personal Initiative 1	Average of standardized z-scores of student`s Personal Initiative I
VI_2_Attitudes	Personal Initiative 2	Average of standardized z-scores of student`s Personal Initiative II
VI_3_Attitudes	Personal Initiative 3	Average of standardized z-scores of student`s Personal Initiative III.

VII_1_Risk_Preference	Risk Preference	How willingly a student takes risk. Based on question from Global Preference Survey.
VII_2_Time_Preference	Time Preference	How willingly a student gives up something that is beneficial for them today in order to benefit more in the future. Based on question from Global Preference Survey.
VII_2_Trust	Trust	Whether student assumes that people have only the best intentions. Based on question from Global Preference Survey.
VII_3_BFI_Extraversion,	Personality traits	Average of extraversion items (reserved/sociable, coded in same direction). BFI10
VII_3_BFI_Agreeableness,	Personality traits	Average of agreeableness items (confident/ tendency to find fault with others, coded in same direction) BFI10
VII_3_BFI_Conscientiousness,	Personality traits	Average of conscientiousness items (thorough job/ tends to be weak, coded in same direction) BFI10
VII_3_BFI_Neuroticism,	Personality traits	Average of neuroticism items (relax/ gets nervous easily, coded in same direction) BFI10
VII_3_BFI_Openness	Personality traits	Average of openness items (active imagination/ few artistic concerns, coded in same direction) BFI10
Behavioral (Experimental) Games		
IX_CRT	Cognitive Reflection Test	Measure of cognitive abilities: Average over three questions
IX_Unscramble_A IX_Unscramble_B	Unscramble Task	Creativity Measure based on Unscramble task: Points Earned Originality Index
IX_Deception	Coin Task	Preferences for Honesty: Reported Correct predictions (aggregated on class level)
IX_Grit_A IX_Grit_B IX_GRIT_C	Grit: Triangle Task	Triangle Task: Success in task (in points); Choice of difficult task Choice of difficult task after failure
IX_BRET	Bomb Risk Elicitation Task	Risk Preferences: Number of Boxes
IX_Dictator	Dictator game	Other-regarding preferences: Amount Given in Dictator Game

IX_PD	Prisoners Dilemma	Preferences for cooperation: If the person choose to cooperate
Psychological Measures		
X0_2_Statistics_total, X0_2_Spanish_total, X0_2_English_total	Subject knowledge	Average of standardized z-scores of knowledge test in Statistics, English and Spanish.
X1_1_A_Personal_ Initiative X1_1_B_Personal_ Initiative,	Subject knowledge - Personal Initiative	Average of standardized z-scores of Personal Initiative Attitude.
X1_2_A_Negotiations_Yielding, X1_2_B_Negotiations_Forcing, X1_2_C_Negotiations_Compromising, X1_2_D_Negotiations_Avoiding, X1_2_E_Negotiations_Problem_Solving	Subject knowledge - Negotiations	Average of standardized z-scores of Negotiations Attitudes (in terms of yielding/Forcing/Compromising/Avoiding and Problem-Solving)
X2_1_ Self_Efficacy	General cognition measures	Average of standardized z-scores of Self-Efficacy measures
X2_2_Youth_Self_Efficacy	General cognition measures	Average of standardized z-scores of Youth Self-Efficacy (SEC-Q) measures
X2_3_Self_Efficacy_Scale	General cognition measures	Average of standardized z-scores of Perceived Affiliate Self-Efficacy Scale measures.
X2_4_Growth_Mentality	General cognition measures	Average of standardized z-scores of Growth Mentality measures.
X2_5_Self_Concept	General cognition measures	Average of standardized z-scores of Self-Concept Scale measures (Independent Self-Construal and Interdependent Self Construal)
X2_6_Self_Regulatory	General cognition measures	Average of standardized z-scores of Self-Regulatory Focus measures (Prevention Focus/ Promotion focus).
X2_7_ Grit_S	General cognition measures	Average of standardized z-scores of the Short Grit Scale (Grit-S) measures
X3_1_Bus_Self_Efficacy	Entrepreneurial cognitions (entrepreneurial mindset)	Average of standardized z-scores of Business Self-Efficacy measures
X3_2_Bus_Oport	Entrepreneurial cognitions (entrepreneurial mindset)	Average of numbers of opportunities that a student has identified in the last three months.
X3_3_Bus_Attitudes	Entrepreneurial cognitions (entrepreneurial mindset)	Average of standardized z-scores of Business Attitudes (Starting a business) measures.
X3_4_Social_Norms	Entrepreneurial cognitions (entrepreneurial mindset)	Average of standardized z-scores of Social Entrepreneurial Norms (in which extent parents/siblings, close friends,

		teachers will agree if a student decides to start a business).