

Evaluating the effectiveness of *Can't Wait to Learn*, a digital personalised learning programme, integrated in formal schools in Uganda: A cluster randomised controlled trial

Summary results submitted to ISRCTN in December 2024. Note that the manuscript is currently under review for publication and therefore it is possible that analysis output may change depending on feedback on the methods used.

Figure 1. CONSORT flowchart

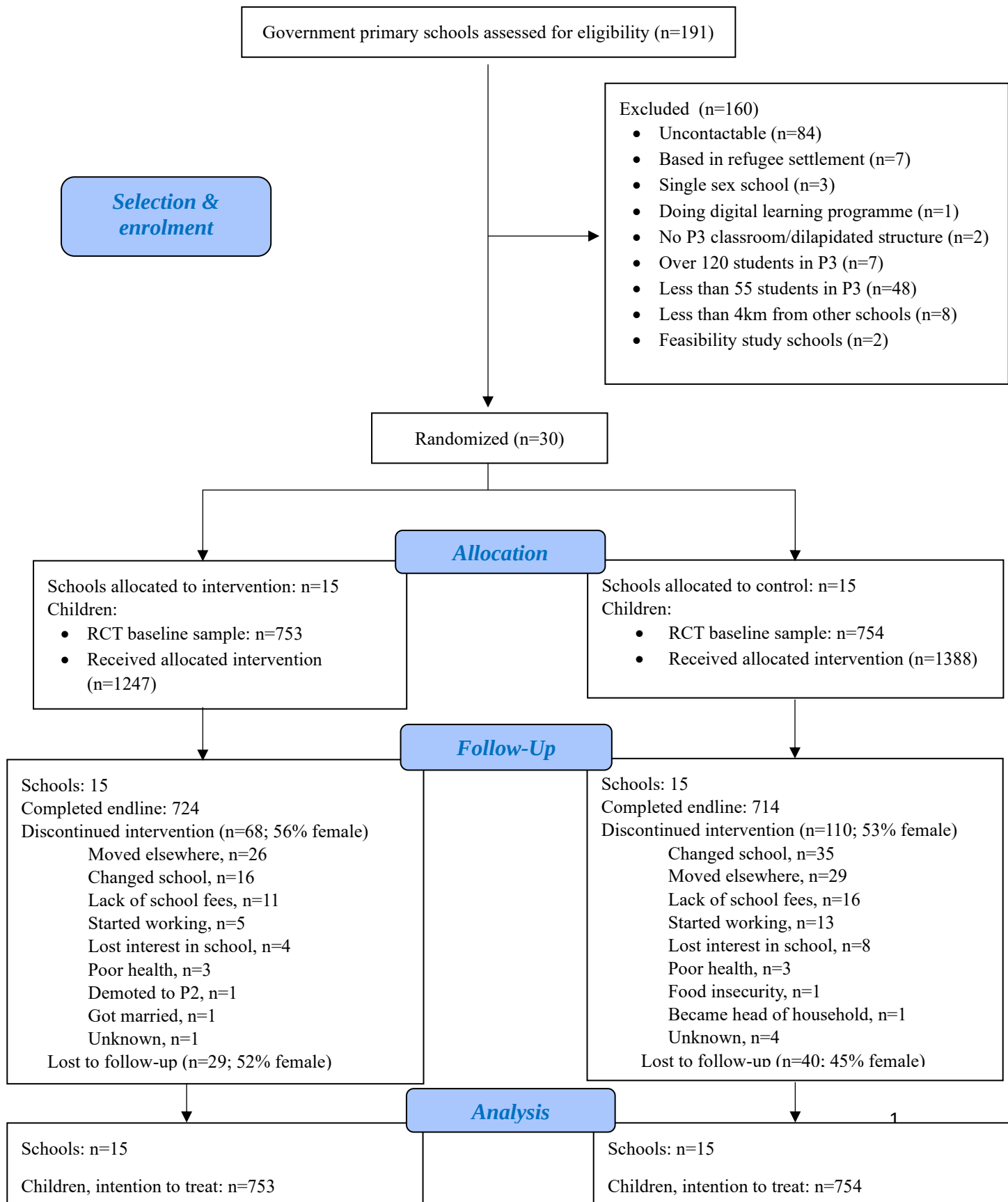


Table 1. Sample demographics at baseline

	Total	Intervention	Control
Participants	1507	753	754
Boys	773 (51%)	369 (49%)	404 (54%)
Girls	734 (49%)	384 (51%)	350 (46%)
Age in years (SD), range	11.5 (1.34), 8-17	11.5 (1.34), 8-17	11.4 (1.34), 8-16
Attended pre-school (%)	1317 (87%)	655 (87%)	662 (88%)
Disability status (caregiver report)			
No disability	1220 (81%)	626 (83%)	594 (79%)
Some disability in one domain	194 (13%)	86 (11%)	108 (14%)
Moderate disability in one domain	21 (1%)	9 (1%)	12 (2%)
Severe disability in one domain	2 (<1%)	0	2 (<1%)
Disability in multiple domains	68 (5%)	30 (4%)	38 (5%)
Parents in the home			
Both biological parents	879 (58%)	443 (59%)	436 (58%)
Mother only	272 (18%)	134 (18%)	138 (18%)
Father only	86 (6%)	35 (5%)	51 (7%)
Neither biological parent	268 (18%)	139 (18%)	129 (17%)
Caregiver education			
Never went to school	301 (20%)	158 (21%)	143 (19%)
Some primary school	731 (49%)	352 (47%)	379 (50%)
Finished primary school	255 (17%)	107 (14%)	148 (20%)
Some secondary school	160 (11%)	93 (12%)	67 (9%)
Finished secondary school	17 (1%)	12 (2%)	5 (1%)
Completed higher or vocational education	41 (3%)	29 (4%)	12 (2%)
Missing	2 (<1%)	2 (<1%)	0

SD = Standard deviation

Outcomes: Linear mixed-model analyses of the intervention effect on literacy, numeracy and wellbeing

	Letter knowledge ♦	Phonemic awareness ♦	Most used words	Decodable words	Reading fluency ♦	Reading accuracy	Reading comp.♦	Listening comp.	Writing	Total literacy♦
Intercept	18.30***	2.20***	3.79***	1.31*	3.52	8.98**	0.14	0.33*	1.14**	0.18***
Gender (male)	-0.19	-0.34*	-0.78*	-0.02	-1.44	-2.44	-0.03	-0.15*	-0.48***	-0.02*
Time (endline)	2.81***	-1.37**	3.84***	2.10***	8.38***	26.48***	0.81***	0.36*	1.40***	0.09***
Attendance	0.03***	0.00	0.06***	0.02***	0.11***	0.24***	0.01***	0.01***	0.02***	0.00***
Time (endline) * gender (male)	-0.31	0.06	-0.11	-0.38	-2.60***	-1.35	-0.15	0.06	-0.19	-0.01
Time (endline) * attendance	0.00	0.03***	0.01	0.01**	0.10***	0.05	0.01**	0.00*	0.01***	0.00***
Group (intervention)	-1.13	1.53***	0.70	0.85*	3.00	3.77	0.18	0.19	0.47	0.04*
Time (endline) * Group (intervention)	1.54***	2.21***	0.65**	1.21***	2.07**	2.03*	-0.05	0.05	-0.39**	0.05***
Cohen's <i>d</i>	0.22***	0.58***	0.15**	0.27***	0.16**	0.13*	-0.02	0.04	-0.15**	0.32***
95% CIs	0.11-0.32	0.48-0.70	0.05-0.24	0.17-0.37	0.06-0.26	0.03-0.23	-0.12-0.07	-0.07-0.14	-0.24 - -0.04	0.21-0.42
Random effects										
σ^2	25.08	7.64	11.29	11.30	112.31	303.28	1.04	0.92	2.73	0.01
τ_{00} (child:School)	11.98	0.731.50	28.60	11.80	198.94	529.04	0.64	0.56	5.67	0.03
(school)	3.09		2.73	0.63	21.70	38.27	0.09	0.11	0.56	0.00
ICC	0.38	0.23	0.74	0.52	0.66	0.65	0.41	0.42	0.70	0.70

♦ primary outcomes ; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table (cont.)

	Number identification	Quantity discrimination	Missing numbers ♦	Timed addition ♦	Timed subtraction ♦	Word problems	Total numeracy ♦	Wellbeing
Intercept	11.10**	7.84***	4.04***	4.28***	3.01***	2.95***	0.45**	32.45***
Gender (male)	0.27*	-0.01	0.25	0.22	0.24	0.19*	0.02*	-0.30
Time (endline)	1.71***	0.59**	1.59***	1.43**	0.80	1.13***	0.10**	-1.23
Attendance	0.01***	0.01*	0.02***	0.02***	0.01**	0.01*	0.00**	0.00
Time (endline) * gender (male)	-0.24	-0.13	-0.34**	-0.58**	0.12	-0.23*	-0.02**	0.29
Time (endline) * attendance	0.00	0.00	0.00	0.02***	0.01*	0.00	0.00*	0.00
Group (intervention)	0.05	0.01	0.51*	1.09***	0.64**	0.06	0.02*	2.65***
Time (endline) * Group (intervention)	0.32*	0.36***	0.13	0.43	1.13***	0.27*	0.03**	0.82
Cohen's <i>d</i>	0.13 0.03-0.23	0.19*** 0.09-0.29	0.06 -0.05-0.15	0.11 0.01-0.22	0.28*** 0.18-0.38	0.14* 0.04-0.25	0.25** 0.16-0.35	0.001
Random effects								
σ^2	3.20	2.04	3.56	10.84	8.21	2.01	0.01	40.89
τ_{00} (child:School)	2.72	0.98	3.19	5.36	3.74	0.80	0.01	0.15
(school)	0.12	0.06	0.21	0.18	0.14	0.14	0.00	0.77
ICC	0.47	0.34	0.49	0.34	0.32	0.32	0.61	0.02

♦ primary outcomes ; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Fidelity of implementation

The fidelity of implementation was measured through observations conducted by project officers using a 19-item form that assessed the classroom environment, tablet management, teacher behaviour, and session length. Weekly student attendance data was also collected by research assistants from class registers completed by teachers. Implementation fidelity was relatively high at 91%, measured across 108 observations (11% sessions).

Ethical review and adverse events

We obtained ethical approval for the methods and tools through The AIDS Support Organisations Research Ethics Committee (reference number: TASOREC/056/2021-UG-REG-009) and the Ugandan National Council of Science and Technology (reference number: SS1024ES). Consent was obtained from caregivers in writing or verbally with a witness in Runyankore for children's participation in both the research and the programme. Assent was obtained verbally and in writing from children. Data collection was only completed if both consent and assent were obtained. Approval was also obtained from Isingiro's District Education Office, school headteachers, and community leaders during the research inception phase. A Data Safety Management Committee, formed of members of the District Education Office, was tasked with overseeing the ethical conduct of the study and monitoring adverse events during the trial. No serious adverse reports were reported.