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Validation of the school engagement measure (SEM) scale for internally displaced person (IDP) learners in North-East, Nigeria

Chikere Ugwuanyi^{a,*}, Josu Solabarrieta Eizaguirre^b, Concepción Maiztegui Oñate^c^a Assessment, Evaluation and Social Education, Faculty of Education and Sport, University of Deusto, Bilbao, Spain^b Teaching, Research and Transfer on Educational Assessment Issues, Research Methods, Innovation and Competency-based Training, And Use of Information and Communication Technologies in Education, Faculty of Education and Sport, University of Deusto, Bilbao, Spain^c Teaching and Research in Social Education, Her Publications Focus on Social Participation and Citizenship, Particularly from an Intercultural Perspective, Faculty of Education and Sport, University of Deusto, Bilbao, Spain

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ABSTRACT

Student engagement measure (SEM) helps to understand learner enrolment, retention, and performance. We report a validation of SEM scale by Fredricks et al. (2004) for Internally Displaced (IDP) learners in 50 locations in Northeast, Nigeria - where Boko Haram ideology is against education. The results confirm the validity of the scale measures. We equally compared various in-groupings of IDP learners to make connections between engagement dimensions and different sociodemographic variables. The comparisons provide insights to help humanitarian education provide tailored learning experiences for IDP learners. All these advance SEM research and adoption in Education in Emergency (EiE).

1. Introduction

The practice of Education in Emergency (EiE) in a context of prolonged and repeated displacement poses peculiar challenges. One of such is how to sustain the interest of learners in learning and eventually return them to formal schools. The difficulty is heightened in a context of active conflict where an insurgency group (Boko Haram) is ideologically opposed to education. This article is a report of the validation of a School Engagement Measure (SEM, Fredricks et al., 2004) scale in Accelerated Learning Program (ALP) for Internally Displaced (IDP) learners in northeast Nigeria, and the analysis of its measure results among different socio-demographic groups. The validation is an Internal Structure¹ validation to confirm if the SEM scale applies in the context of

ALP, IDP learning community and Northeast, Nigeria. We are not aware of any prior validation of any SEM scale in the above context.

The interest to explore SEM scale validation came from a review meeting of teachers who were teaching IDP learners in different camps and locations in the Northeast, Nigeria.² The teachers were concerned about the lack of enthusiasm by some of the learners. Since education is a high-risk activity since Boko Haram particularly targets schools; and a high-stake endeavor since the future of the learners post displacement is hinged on it, all stakeholders were exploring how to better enhance student engagement.

In addition to the immediate concerns of teachers, there are other compelling reasons to explore school engagement in the Northeast. Chief among them is that the preparedness and resilience of EiE

* Corresponding author.

E-mail addresses: Chikere.ugwuanyi@opendeusto.es, chikeresj@gmail.com (C. Ugwuanyi), josu.solabarrieta@deusto.es (J.S. Eizaguirre), cmaizte@deusto.es (C.M. Oñate).¹ Generally, validation measures the degree of accuracy of an instrument. Different focus of validation like constructive validity of an instrument attempts to measure how the theoretical concept is adequately captured/measured by data. Content validity of an instrument measures all relevant parts of a targeted subject. This can be done through (a) test content analysis, (b) relation to other variables analysis, (c) internal structure of the instrument analysis, (d) response process analysis (e) consequences of testing analysis.² The official title of the program is "Strengthening Education: Restoring Resiliency in Teaching and Learning Systems in Borno and Adamawa States." The program was implemented by Jesuit Refugee Service (JRS), an International Non-governmental Organization (INGO). The program was implemented in 50 locations in five Local Government Areas (LGA) of Borno and Adamawa states, Northeast Nigeria. Boko Haram insurgency is most active in these LGAs and the education program was implemented in IDP camps/locations as an effort to sustain the interest of displaced learners in education pending when they can be returned to formal school.

intervention is further tested by armed conflict. Any crisis-affected EiE endeavor is bedeviled by added dynamics of the effects of trauma on the learners that impacts on their social, emotional, behavioral, and cognitive engagements (Koslowski, 2023). Another reason is that teachers and other stakeholders in EiE may not be aware of tail signs of trauma, trained on how to handle such learners (Rossen, 2020), or aware of the secondary effect of trauma on them as caregivers (Figley, 1995). Thus, a study of school engagement will provide the stakeholders in EiE some baseline information to benchmark their practice.

There are various ways to study student engagement (Inman et al., 2020; CEEP, 2022; Singh & Srivastava, 2014, Fredricks et al., 2004). Negatively, one can approach it through the study of students' disengagement (Fredricks et al., 2019). In this approach, when one understands why students disengage, one can easily proffer solutions for their engagement. Positively, one can study it through studying important modes of engagement such as collaborative learning (Xu, 2024), teacher-student relationship (Thornberg, 2020), conducive environment (Closs and Imms, 2022), pedagogical style (Inayat & Ali, 2020), among others. However, both approaches are external to the learners. The approaches are not able to delve into inner recesses of the child to understand his/her disposition to learning engagement. The externality of the approaches become more evident in a context of conflict and prolonged displacement where the external structures may be absent or not ideal to use for a study on student engagement.

Therefore, our approach to student engagement is to focus on learners' self-awareness – the psychological dimension of engagement. We believe that learning how learners behave, feel and think are key to the development of finely tuned intervention in EiE. The objective of this study is to present a report on the validation of School Engagement Measure (SEM, Fredricks et al., 2004). Our choice to use Fredricks et al. (2004) scale is because it focused on the inner/psychological dimension of engagement. The three dimensions they measured are psychological approaches to evaluating engagement. In behavioral engagement, learners are considered to show a high level of behavioral engagement if they show resilience in school and avoid at risk behaviors (Finn & Rock, 1997). In emotional engagement, learners are expected to react positively to school environment and the positive feeling about the outcome of the education (Skinner et al., 1990). In cognitive engagement, learners are dedicated to learning while making some decisions for self-efficacy that will improve their learning for better academic success (Greene et al., 2004). In other words, the behavioral dimension focuses on positive attitudes and conceptions (adherence to the rules) and visible disposition to learn (paying attention during lessons. The emotional dimension is the affective disposition of the learner towards education (finding joy in learning) and having an affective community in the educational environment. The cognitive dimension is about the investment strategically in learning (development skills to achieve higher goals) so as to work hard but smart.

In the light of the foregoing, the first part of the article presents the context why the validation of the scale is opportune. It narrates how the advent of Boko Haram and its ideology against education created watershed situations for a low student engagement. The second part explains the methodology and how some SEM scale items are adapted for the ALP-JRS context. The third section presents numerical figures showing indicators of the validity and reliability of the measurement model; and a comparison of various levels of scores between socio-demographic groups (gender, location, spatial diversity, In-School, and Out-of-School learners). The final part discusses the results of the comparisons using previous literature review contributions and insights from the observations. The comparisons among various socio-demographic groups shall provide broader data to support the practice of Accelerated Learning program as a plug-in measure for those whose

education has been truncated especially by violence and displacement.

We hope that validating a SEM scale in the above context shall contribute to its use in school engagement promotion policies and practices for EiE. We equally hope that the knowledge about student engagement and the availability of a validated scale of measurement shall advance the practice of IDP education in that region marred by prolonged and repeated displacement. Teachers can administer the validated instrument at the beginning of any educational program so that they can know the parameters of emotional, behavioral, and cognitive dimensions of their students.

2. the contexts: Boko Haram, Education in Emergency (EiE) dynamics, and school engagement

The Boko Haram (BH) insurgency in Northeast Nigeria has dominated conversations for many years. Various reasons are advanced for its emergence and sustained presence (Onuoha, 2012; Pham, 2012). Some consider BH as an extension of international network of contemporary jihadist group (Onapajo et al., 2012); others say that it a conspiracy theory against Islam (Bunza, 2012); while others purport that it is a benign effort to cripple Northern Nigeria economically (El-Rufai, 2012), or part of pawns in a chess game among major political parties in Nigeria (Asuelime & Adekoye, 2015). Afzal (2020) of Brookings Institute believes that Boko Haram emerged to exploit long-standing grievances in northeast Nigeria. Our concern is not to explain the origin or motive of Boko Haram; rather, our research observes that, for whatever be the reasons for Boko Haram's existence, the learning community of north-east Nigeria has been devastated by the disruptions of education programs and destruction of the educational infrastructures.

While a catalog of BH atrocities against the education system may take years to be completed, a programmatic threat issued in a video message on August 12, 2013, by the Boko Haram leader, Abubakar Shekau, is revelatory of its intent: "We did say we were going to burn down schools offering Western education because they are not Islamic schools. They are schools primarily established to wage war on Islam. We fight teachers who teach Western education. We will kill them before their students and will tell the students to henceforth go and study the Koran. This is what we do. We will continue carrying out such school attacks till we breathe our last breath" (Why attacks on schools?" #2) To lend credence to their determination, the sect carried out a famous kidnapping of nearly 300 schoolgirls in Chibok, Borno State in 2014. Many of them are still in captivity. Those who have been released or rescued are still dealing with the traumatic experiences.

Those who were not kidnapped are in IDP camps/locations in traumatic cycles of violence and repetitive displacements. In some of those camps/locations, when an education program like the ALP is offered, no one can guarantee school engagement. This is because, as Kuban and Steele (2011, p. 41) point out, trauma can "impact learning, behavior, and social, emotional, and psychological functioning." While enrolled in such programs, children exposed to traumatic experiences may exhibit passivity, inability to concentrate, verbal and physical blow-ups, frequent absences, and "spacing out" (Sitler, 2009, p. 120). Thus, the EiE for IDP learners in Northern Nigeria must contend with realities of displacement, exposure to conflicts and trauma.

The reality of displacement, exposure to conflict and trauma are the threads that hold Education in Emergency and School engagement together. On the one hand, the aims of EiE include to (1) provide a sense of normality; (2) restore hope through access to the 'ladder' of education; (3) support psychological healing from traumatic experiences through structured social activities in a 'safe space'; (4) provide protection for marginalized groups – minorities, girls, children with disability, out-of-school adolescents – often at risk of exploitative or

unsafe work such as prostitution or recruitment by militias (Sinclair, 2001). On the other hand, school engagement is essentially a person-context construct (Li et al., 2021) whereby an engaged child is one who is capable of developing functional experiences from all the encounters in daily life. School engagement is part of the accountability movement in education (Richburg, 1971) focusing on how to support students based on their strengths and not their weaknesses (Kristján, 2012, p. p3). It identifies a good index of learning that would lead to good academic success (Ros, Goikoetxea, Garin and Lekue, 2012). In other words, EiE and student engagement discourses are linked in our context by the Boko Haram insurgency which created a perfect storm for student disengagement.

In the light of the above, EiE for IDP requires some baseline information on the mind-set of the learners to be effective. The baseline information will enable educators to approach the educational intervention so as to tailor it to the needs of learners who may be traumatized by displacements. While such baseline information can be gotten in various ways like conducting psychological tests, the context of IDP in Northeast may make such professional approach less probable. Therefore, a validated SEM that is handy and easier to use serves as a good tool to support EiE efforts IDP learners. A SEM scale that shares similarities of contexts and respondents is most suitable for validation.

3. Method and data collection

As indicated above, the objective of the study is to present the validation of a SEM scale that will enable teachers understand IDP learners better in the Northeast. The teachers and other stakeholders desire a deeper understanding of learners in order to maximize the benefit of IDP education. There are different methods of assessing engagements for such purposes. Methods like observation of the students (Hilberg, 2004; Volpe et al., 2005; Renninger & Jessica, 2015) and multidimensional variables (Wang et al., 2011; Glanville, & Wildhagen, 2017) could be termed 'external' to the learners. Methods like self-report surveys, with three or more dimensionalities (Veiga, 2016) can be termed 'internal' to the learners. Whatever method that may be adopted, Reschly and Christenson (2012) demonstrated the importance of context as fundamental in student engagement studies. This is because levels of school engagement are related to context, understood as presence or lack of adequate support structures for learning (Lippman & Rivers, 2008). A school engagement scale validation effort must therefore take into cognizance the specific context of Northeast Nigeria marked by Boko Haram insurgency and its ideological opposition to education.

The choice of the engagement measure scale by Fredricks et al. (2004) is mainly because the original respondents share similar context with the IDP learners. The original context was an urban, lower elementary, minority group in the United States of America. The IDP learners share similar context of living in clustered camps, still at elementary level of education, and are on the margins of education. The original respondents are exposed to urban violence just as the IDP learners are exposed to the violence of Boko Haram insurgency. These similarities make the chosen SEM scale suitable for adaptation and validation for the population of IDP learners in Northeast Nigeria.

Fredricks et al. (2004) scale originally includes 19 items and consists of three dimensions: (1) Behavioral engagement, (2) Emotional engagement and (3) Cognitive engagement. The Behavioral engagement factor (5 items; $\alpha = 0.74$ reported by original authors) incorporates students' participation in school such as paying attention to the teacher, following school rules and the absence of problematic behaviors. The Emotional engagement factor (6 items; $\alpha = 0.81$) encompasses emotional responses to teachers, classmates, or school. The Cognitive engagement factor (8 items; $\alpha = 0.77$) refers to the student's investment

Table 1

Frequencies of status: HC/IDP/RE.

Type IDP Status	Sex	Counts	% of Total
Host Community (HC)	F	126	25.2 %
	M	88	17.6 %
Internally Displaced Person (IDP)	F	114	22.8 %
	M	62	12.4 %
Returnee (RE)	F	69	13.8 %
	M	41	8.2 %

level in the schoolwork and includes individual effort and self-regulation strategies. The response format is a five-point Likert scale ranging from 1 (Never) to 5 (All the time).

We adapted the scale in this way: Since the IDP teachers know the context better, we asked them to propose alternative registers that convey the same meaning as in the original item. We equally them to phrase items in the manner that learners can relate to (See Appendix 1 for the full adaptations). At the end, the following questions were adapted: Question 14 (I try to watch "Africa Magic" about things we do in school), Question 16 (My parents bring "Lesson Teacher" to help me understand better). Question 17 (If I don't know what a word means when I am reading, I do something to figure it out, like look it up in the dictionary or ask someone). And Question 18 (I try to watch TV shows about things we are doing in school). During the trial-testing of the adapted items, we found out that learners could not understand the nuances embedded in 7 Likert scale responses. Therefore, the response format was reduced to a four-point Likert scale ranging from 1 (Never) to 4 (All the time). This idea is in accord with (Hartley & MacLean, 2006, p. 814) who noted that context specific difficulty "of distinguishing subtle differences in attitudes or behaviors (e.g. 'Some of the Time' vs. 'Often' or 'Always') ... may be vulnerable to low response rates".

The sample for the validation is the participants of an on-going Accelerated Learning Program (ALP), an educational program for the Internally Displaced Persons (IDP) learners. The educational program was organized by Jesuit Refugee Service (JRS), an INGO working in northeast Nigeria. They used probabilistic sampling in choosing learners from 50 different IDP camps/locations, 5 Local Government Areas (LGAs), in two states (Borno and Adamawa) in Northeast Nigeria. The JRS team selected the participants in the program according to the following criteria: (a) a learner must be between 6 years and 18 years old since ALP is designed for that age group; (b) out-of-school children made up 70% of the learners while in-school children are 30%. (c) Priority was given to IDPs (IDP) (at least 50%), while Host Community (HC) and Returnees (RE) made up the rest 50%; (d) priority was given to PWDS (Persons with disability) if the disability is not severe enough for them to participate. Finally, the gender ratio was 60% Girls and 40% Boys.

The program defines HC as 'displaced' persons whose house or community or ordinary way of life has been dislodged by the entry of displaced persons. Part of the rationale for including them into educational program is that they suffer displacement and attendant loss of access to education as others. The IDP qua IDP are those who are displaced for the first time from their location. The Returnees (RE) are those who have experienced multiple displacements are back to the camp/location that they have been earlier. They generally have more experience of surviving in displacement. For educational status, 'In-school' are those who were attending a formal school before displacement. 'Out-of-school' are those who were not attending any formal education prior to displacement. The geo-locations are the Local Government Areas of Borno and Adamawa where displacement by Boko Haram is concentrated in both states.

At the end of the selection process, Tables 1–3 show the distributions

Table 2
Frequencies of education status.

EDUCATION_STATUS	Sex	Counts	% of Total
In-school (IS)	F	123	24.6 %
	M	75	15.0 %
Out-of-school (OS)	F	186	37.2 %
	M	116	23.2 %

Table 3
Frequencies of geo-locations.

LGA	Sex	Counts	% of Total
ASKIRA/UBA	F	61	12.2 %
	M	39	7.8 %
BIU	F	65	13.0 %
	M	35	7.0 %
HAWUL	F	63	12.6 %
	M	37	7.4 %
MADAGALI	F	61	12.2 %
	M	39	7.8 %
MICHIKA	F	59	11.8 %
	M	41	8.2 %

Table 4
CFA Indicators' estimates table – Initial measurement model.

Initial Confirmatory Factor Analysis						
Factor	Indicator	Estimate	SE	Z	p	Stand. Estimate
Behavioral	SEM_Q1	0.32	0.03	12.04	<0.001	0.58
	SEM_Q2	-0.25	0.04	-6.24	<0.001	-0.33
	SEM_Q3	0.07	0.05	1.42	0.154	0.08
	SEM_Q4	0.35	0.03	13.01	<0.001	0.65
	SEM_Q5	0.26	0.03	9.62	<0.001	0.48
Emotional	SEM_Q6	0.37	0.03	14.46	<0.001	0.69
	SEM_Q7	0.40	0.04	10.62	<0.001	0.54
	SEM_Q8	0.21	0.05	4.50	<0.001	0.24
	SEM_Q9	0.31	0.03	11.04	<0.001	0.54
	SEM_Q10	0.36	0.03	12.62	<0.001	0.61
Cognitive	SEM_Q11	-0.15	0.05	-2.95	0.003	-0.16
	SEM_Q12	0.39	0.03	11.64	<0.001	0.59
	SEM_Q13	0.30	0.08	3.66	<0.001	0.20
	SEM_Q14	0.31	0.05	6.33	<0.001	0.35
	SEM_Q15	0.37	0.03	12.21	<0.001	0.61
	SEM_Q16	0.18	0.06	3.10	0.002	0.18
	SEM_Q17	0.38	0.08	4.57	<0.001	0.24
	SEM_Q18	0.38	0.03	11.40	<0.001	0.58
	SEM_Q19	0.39	0.04	10.83	<0.001	0.56

of each category of respondents.

The questionnaire was administered asynchronously, but in an examination condition. The supervisors were only permitted to explain instructions or translate a concept to a language that the learner understands better.³ The study was conducted in accordance with the Declaration of Helsinki and all participants gave their informed consent for inclusion before they participated in the study. Data was codified and calculated using JAMOVI 2.3 version (The Jamovi Project, 2022).

4. Results and discussions

The results will be presented in two sections. The first section shall

³ It is noteworthy that the tests were in English language. However, English is the 4th language for most learners. They speak their mother tongue, then Hausa, then the language of the place where they are taking refuge and a mélange of other languages of people who live around them since the IDP camps/locations are clustered.

Table 5
CFA Indicators' estimates table – Final measurement model.

Final Factor Estimate						
Factor	Indicator	Estimate	SE	Z	p	Stand. Estimate
Behavioral	SEM_Q1	0.33	0.03	12.27	<0.001	0.59
	SEM_Q2	-0.25	0.04	-6.48	<0.001	-0.34
	SEM_Q4	0.35	0.03	13.09	<0.001	0.65
	SEM_Q5	0.26	0.03	9.55	<0.001	0.48
Emotional	SEM_Q6	0.37	0.03	14.33	<0.001	0.69
	SEM_Q7	0.38	0.04	10.21	<0.001	0.52
	SEM_Q9	0.31	0.03	11.26	<0.001	0.55
	SEM_Q10	0.37	0.03	12.68	<0.001	0.62
Cognitive	SEM_Q12	0.38	0.03	11.05	<0.001	0.57
	SEM_Q14	0.27	0.05	5.52	<0.001	0.30
	SEM_Q15	0.38	0.03	12.29	<0.001	0.63
	SEM_Q18	0.38	0.03	11.01	<0.001	0.57
	SEM_Q19	0.40	0.04	11.32	<0.001	0.58

report the validity evidence of the scale. The second section shall report the analysis of the differences in educational engagement following the socio-demographic variables of the ALP-JRS program. The discussion shall focus only on the relations between the values and the variables.

4.1. Reporting validity evidences

The SEM is validated by showing goodness of fit through CFA and interrelations among the variables. The contribution of the validation effort is when the outcome of the validation exercises is analyzed according to the socio-demographic variables of IDPs and the geo-locations of the IDP in the five LGAs. Table 4 contains the Initial CFA measurement, while Table 5 shows the final CFA measurement

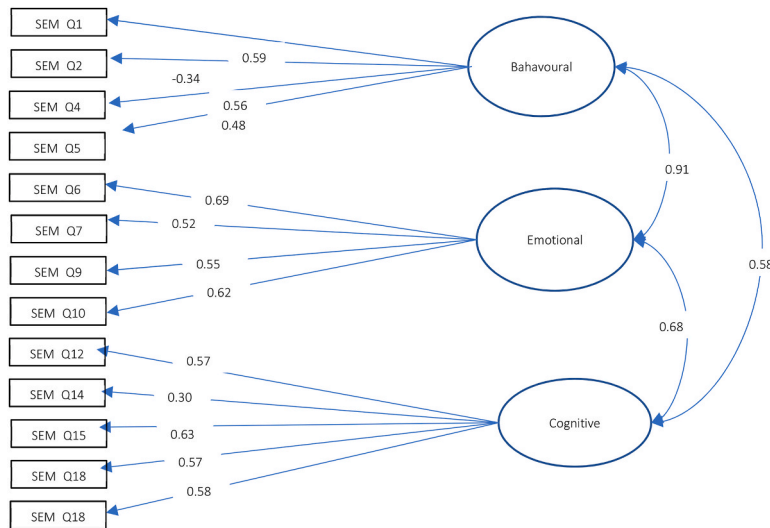
A pilot data gathering was done in IDP camps/learning centers. The purpose was to know if the scale makes any sense to such a subgroup of learners. When the authors' original measurement model was formally tested in our set of data, the Goodness of Fit indices were poor (CFI = 0.74, TLI = 0.70 and RMSEA = 0.074) and we obtained the indexes shown in Table 1. Therefore, the original version was adapted using the guidance, rules and recommendations about questionnaire adaptation set forth by the International Test Commission (ITC; Muñiz, Elosua, and Hambleton, 2013) to correctly adapt an instrument to a particular context. It paid specific attention to the cross-cultural operationalized checklist of ITC advanced by Hernández et al. (2020). We considered non-significant (p > .05) standardized estimates or those below 0.3 being insufficient. Instrument items 3, 8, 11, 13,16 and 17 were discarded for these reasons. In discussion, we shall give some reasons for the poor connection of the items with the latent factors.

When we introduced modifications in the measurement model, removed some indicators, the Goodness of fit indices were acceptable (CFI = 0.92, TLI = 0.89 and RMSEA = 0.057) and we obtained the indexes shown in Table 5. In order to get a better picture of the final correlations, Table 6 shows the interrelation within the SEM dimensions, thus:

Table 6
Interrelation within SEM dimensions.

	SEM_Behavioral	SEM_Emotional	SEM_Cognitive
SEM_Behavioral	-		
SEM_Emotional	0.56	-	
SEM_Cognitive	0.35	0.36***	-

Note. *p < 0.05, **p < 0.01, ***p < 0.001.



Internal consistency coefficients were also acceptable (SEM Behavioral $\alpha=0.58$, SEM Emotional $\alpha=0.69$, and SEM Cognitive $\alpha=0.66$).

Fig. 1. Path Diagram showing combination of CFA Final and Interrelation within SEM Dimensions. Internal consistency coefficients were also acceptable (SEM Behavioral $\alpha = 0.58$, SEM Emotional $\alpha = 0.69$, and SEM Cognitive $\alpha = 0.66$).

Table 7
SEM dimensions and independent samples of sex (M/F).

		Male		Female		M diff	Cohen's d	t	df	p-value
		M	SD	M	SD					
SEM	Behavior	3.17	0.35	3.19	0.37	-0.02	-0.05	-0.53	414.00	0.593
	Emotional	3.22	0.42	3.27	0.40	-0.05	-0.12	-1.18	383.00	0.238
	Cognitive	2.99	0.64	3.01	0.42	-0.02	-0.04	-0.38 ^a	404.00	0.708

^a Levene's test is significant ($p < .05$), suggesting a violation of the assumption of equal variances.

The relationships between the three dimensions were also calculated as part of the analysis of the new measurement model Table 6. There are significant positive correlations between Emotional, Behavioral and Cognitive engagements. The strongest link is between Emotional and Behavioral ($r = 0.56$), and Cognitive is not so strongly related to Behavioral ($r = 0.35$) and Emotional ($r = 0.36$). The final measurement model is shown in the diagram in Fig. 1.

4.2. Reporting comparisons between SEM dimensions and socio-demographic variables

Having validated the engagement measurement scale, it is now opportune to explore how the values obtained in different socio-demographic groups. As mentioned, the demographic variables helped the organizers to have a fair representation of the target population. For us, analyzing them can give insight into how each variable compares with SEM dimensions.

Student engagement differences are positive (in favor of female

students) but very small (see Table 7). The only statistically significant difference is the one in literacy gain ($p = .024$), but with a small effect size ($d = 0.21$). IDPs had higher mean than HC and Returnee (see Table 6). Cohen's D is large – which supports the large improvement. The differences were statistically significant in many of the cases.

Homoscedasticity or balance in variances is significant in every dimension using Levene's *t*. Therefore, we tested the hypothesis with Welch's *T*, as it is more robust under these circumstances. In Table 8 Out of school students show significantly higher levels of behavioral and emotional engagement ($d = 0.55$ and $d = 0.36$, $p < .001$), with no significant differences in cognitive engagement. Furthermore, the Out-of-School scores are better on behavioral and emotional spheres; but in-school had better scores on the cognitive sphere.

There are almost no differences in cognitive engagement among the three residence groups Table 9. However, there are small and statistically significant differences in behavioral and emotional engagement. IDP learners have a slightly higher level of behavioral and emotional engagements compared with host community and returnee students.

Table 8
SEM Dimensions and Education Status – In school/Out of School.

		In School		Out of School		M diff	Cohen's d	t	df	p-value
		M	SD	M	SD					
SEM	Behavior	3.07	0.32	3.26	0.37	-0.19	-0.55	-5.49 ^a	414.00	<0.001
	Emotional	3.16	0.34	3.31	0.44	-0.15	-0.36	-3.45 ^a	383.00	<0.001
	Cognitive	3.02	0.38	2.98	0.58	0.04	0.07	0.74 ^a	404.00	0.459

^a Levene's test is significant ($p < .05$), suggesting a violation of the assumption of equal variances.

Table 9
SEM dimensions and residence status – host community, IDPs and returnees.

Residence Status		Host Community		IDP		Returnee		F Welch's	p-value Welch's	η^2	post hoc
		M	SD	M	SD	M	SD				
SEM	Behavioral	3.12	0.40	3.26	0.32	3.18	0.34	6.33	0.002	0.03	HC vs IDP and RE
	Emotional	3.20	0.37	3.32	0.41	3.23	0.46	3.48	0.033	0.02	HC vs IDP and RE
	Cognitive	3.00	0.45	3.03	0.62	2.96	0.41	0.63	0.535	0.00	HC vs IDP and RE

Table 10
SEM dimensions and geographical distribution.

Geographical Distribution		Askira Uba		Biu		Hawul		Madagali		Michika		F Welch's	p-value Welch's	η^2	post hoc
		M	SD	M	SD	M	SD	M	SD	M	SD				
SEM	Behavioral	3.10	0.27	3.33	0.40	3.20	0.38	3.09	0.27	3.22	0.43	6.51	<0.001	0.06	Biu vs Askira/Uba and Madagali
	Emotional	3.26	0.39	3.37	0.44	3.25	0.37	3.12	0.36	3.27	0.45	3.75	0.006	0.04	None
	Cognitive	2.95	0.54	3.15	0.48	3.01	0.55	3.11	0.29	2.79	0.58	6.66	<0.001	0.06	Michika vs Madagali and Biu

This is an indication that the residence status matter in behavioral and emotional engagements of learners.

We found significant differences between regions in the three dimensions of the educational engagement (see Table 10). However, the pattern of the differences is irregular. As such, different regions show higher or lower scores on one or another dimension. Overall, participants from Biu showed the highest engagement levels in every dimension. Students from Askira Uba and Magadali had the lowest scores in behavioral engagement. Magadali participants were also especially low in emotional engagement. The lowest cognitive engagement level was found among Michika participants (see Table 8).

In sum, the analysis of different sociodemographic variables shows that SEM scale dimensions clarify learners' context. The dimensions analyzed above are unique to EiE and IDP contexts. Thus, the insights from comparisons are primary data to provide tailored support for such a population. In the next section, we provide further explanations to these differences to deepen understanding and enhance practice.

4.3. Discussions

We have confirmed the validity of the final measurement model through adequate goodness-of-fit indices. The discussion shall focus on insights from dimension results and how it clarifies the internal results of various sociodemographic groups. The sociodemographic variables are the Education Status – In school/Out of School; Residency Status - IDP, Host Community and Returnee; and Geographical Locations – five LGAs. We are not aware of any previous research on this population and context using SEM variables. The discussion is enriched by notes taken during field trips.

4.3.1. SEM dimensions and gender

There was an overall, though small, positive SEM difference in favor of female students. This is in line with conventional presumptions that females are generally better than males in SEM dimensions in early age (Cinar, 2023). However, Rawat and Singh (2017) observed such presumptions are not scientifically supported and found that boys achieve greater emotional maturity than girls. Their explanation is that in a patriarchal system, boys are given greater opportunity to explore the environment and gain emotional stability while doing so (p. 130). Be that as it may, more research may be needed to examine if the context of displacement reinforces the mitigating factors of patriarchy that they were trying to undermine.

4.3.2. SEM dimensions and school status – in-school and out-of-school

Out of school students show significantly higher levels of behavioral

and emotional engagement than In-school students, with no significant differences in cognitive engagement. Furthermore, the Out-of-School learners are better on behavioral and emotional spheres, but in-school learners on the cognitive sphere. Given that one objective of ALP-JRS is to transit learners to regular schools, we opine that a learner with higher behavioral and emotional measures may benefit more from the transition to formal school. This could mean that Out of School learners may have a higher chance of returning and remaining in school eventually. Thus, ALP-JRS will have greater success by increasing the number of Out of School students in the program. The Out-of-school children made up 70% of the learners while in-school children are 30% is a good practice.

4.3.3. SEM dimensions and residence status – host community, IDPs and returnees

The result shows that there are almost no differences in cognitive engagement among the three groups. This could mean that displacement affects cognitive dimension of IDP learners equally. It could also mean that the cognitive engagement level of the population is similar irrespective of displacement. We observed however that the IDP context is bereft of sufficient stimuli to aid interactive encoding between context and items in the cognitive realm. Two meta reviews (Hockley, 2008; Wang, 2023) show a strong link between context reinstatement and recognition. The result also shows that IDP learners have a slightly higher level of behavioral and emotional engagements compared with host community and returnees. While we do not have a good explanation for the result, it shows that IDP children are not (relatively) behavioral and emotional wrecks. They are not completely filled with emotional frustration from mistrust (Miller and Affolter, 2002) or excessively clingy (Kum, 2011), or lost a patterned meaning of their identities (Alexander, 2004). The nuance from the result aligns with our observation that IDP learners are more focused on what is at hand unlike the Host Community and Returnees who tend to have more latitude for indiscipline.

4.3.4. SEM dimensions and geographical distribution

There was an irregular pattern of differences between regions in the three dimensions of the educational engagement. Learners from Askira Uba and Magadali had the lowest scores in behavioral engagement. Magadali participants were also especially low in emotional engagement. The lowest cognitive engagement level was found among Michika participants. We are not able to decipher why different regions show higher or lower scores on one or another dimension.

However, Biu showed the highest engagement levels in every dimension. We learned from conversations among the locals that Biu

never experienced a direct attack of Boko Haram insurgency. This led to a relative perception of peace *within* Biu. The effect of the perception is in accord with Greco and Polli (2021) who observed that people feel safe, are safe and act safe when there is an overall perception that a place is safe. The perception is also in accord with Reid et al., 2020 who observed that the feelings of insecurity are negatively related to trust among people and in government institutions.

In sum, discussing the SEM dimensions in relation to the above sociodemographic variable is a major contribution of the validation of SEM scales. The predominant sociodemographic considerations are income and social status when discussing variances in SEM. However, the context of displacement, while not eliminating all advantages of income and status, significantly reduces its influence. The article gives the ALP-JRS and related organizations other perspectives into the education of IDP learners.

5. Conclusions

The motivation for this work is the solicitude to enhance student achievement in the non-formal context of IDP learners in northeast Nigeria. In that space, Education in Emergency (EiE) is hampered by prolonged and repeated displacement, as well as the active violence fuelled by ideological opposition to education by Boko Haram. The effort at validating a SEM scale in that context is part of that solicitude. With little adaptation, the scale achieved a goodness of fit. It is a brief scale, easy to apply, that can be used in a very feasible way, and that can provide a good insight into the level of educational involvement of the participants in the program.

The overall sample size - 500 respondents - who are beneficiaries of the EiE program organized by Jesuit Refugee Service using ALP pedagogy, are not large enough for the whole population or even the IDP population. However, the geographical spread of the sample – 50 locations in 5 LGA, are extensive. Thus, what the sample lacks in size, it merits in spread.

One of the aims of the ALP education program is that it is a stop-gap for beneficiaries so that they can continue their education at an opportune moment. The comparisons of the sociodemographic groups will be useful in targeting which population may be able to achieve the aim of the program. From various result indicators, it is likely that “Out of school” “IDP learners” in “Biu LGA” fits the best profile of a prospective candidate. Greater analysis will help to tease out other supporting results for practice in EiE and Northeast.

Among other findings, the comparisons showed that those with high cognitive dimension (in-school learners) did not necessarily score well in emotional and behavioral dimensions. This may be instructive for practice in EiE whereby beneficiaries are selected chiefly on pre-post-test that cognitive dimension dominates.

In sum, this research contributes to the inquiry about validation and the ways of attuning the items to be sensitive to different contexts and categories of respondents. The displacement caused by Boko Haram in the Northeast Nigeria, and the cocktail of sociodemographic respondents provide a good population for the validation. The differences in values of SEM dimensions are instructive for practice of NGO education. Further research on other necessary interrelations and connections may follow.

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CRediT authorship contribution statement

Chikere Ugwuanyi: Writing – original draft, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Josu Solabarrieta Eizaguirre:** Writing – review & editing, Supervision,

Formal analysis. **Concepción Maiztegui Oñate:** Writing – review & editing, Supervision.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

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