

# **‘Are We Included?’ A validation of the parental perceptions of Inclusion Climate Scale (ICS)**

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## Section 1 - Introduction

In March 2022 Plymouth City Council commissioned Plymouth Marjon University and the University of Plymouth to conduct research on three assessment instruments measuring inclusion from the perspectives of students, parents and teachers.

The research projects were part of *Plymouth Place-based School Improvement* project. At the time the project focused on three strategic priorities: school leadership, curriculum and inclusion. To deliver on its priorities a number of key stakeholders were brought together, including the Education Endowment Fund (EEF), Plymouth Local Authority, the Regional Schools' Commissioner, Headteachers, MAT CEOs and their leadership teams who chosen to take a collaborative and sustainable approach to ensure rapid school improvement.

The research aimed to support Plymouth's strategic priority of inclusion and took place between May and August 2022. The concept of 'inclusion education' has been debated in Organisation for Economic Co-operation and Development (OECD) countries since an early UNESCO (1994) report. Since then, the debate has been enriched with a multitude of ideas, mainly championing the initiatives of comprehensive learning environments where all children would be included in the learning but also social life. Highly cited research, however, such as Avramidis and Norwich (2002) has maintained that any inclusive policy - no matter how well-designed or funded it is, depends heavily on the attitudes of teachers to be successful. Various factors have also been identified as affecting teachers' attitudes towards inclusion education, such as teachers' experience, school ethos etc.

Teachers, however, are not the single important dimension which affects the success of failure of any inclusion policy or implementation. In a very meticulous literature review, Qvortrup and Qvortrup (2018) have proposed additional important dimensions of consideration, such as the types of 'social communities' in and out of school, which may include the role of class context, the relationship of learners with other school agents such as teachers, other children, staff etc. Comprehensive considerations which take into account both teachers, learners and parents seem to be necessary in order to have a holistic view of inclusive education in any given learning environment.

Investigating the perceptions and role of learners has been intensified in the last two decades, mainly with quantitative surveys, but also with other research paradigms. For example, Schwab et al., (2018) conducted a relatively large-scale survey of students' (aged 10-17 years) perception of the climate in their classrooms, using the Inclusion Climate Scale (ICS). The findings revealed that there are two major dimensions of students' attitude: teacher support and emotional experience. This comes to no surprise and teachers' role is expected to be central in the every-day life of a young learner; certainly, the emotional experienced of a young learner would be expected to depend heavily on the degree of support an individual receives in the class. Sointu et al., (2017), for example, Sointu et al., (2017) provided evidence that "Positive student-teacher relationships are related to students' academic achievement and behavioural and emotional adjustment" (p.457).

Early on, however, it was found that parents - in addition to teachers - could be an important agent to facilitate successful inclusion. De Boer et. al., (2010), in a very

informative literature review, suggested that a positive parental attitude towards inclusion is very important for children to enjoy a successfully inclusive life in the learning environment. Large scale research focusing on parents in the last years has also re-iterated their important role for a successful implementation of inclusive education (see, for example, Paseka and Schwab, 2020).

As it has been discussed in the paragraphs above, we may consider teachers, learners and parents to be the vertices of an isosceles triangle. As a result, *the 'Are We Included?' A validation of the Teachers'* project has been developed, employing both qualitative and quantitative methods to investigate the role of all three important agents of inclusion education: parents, students and teachers.

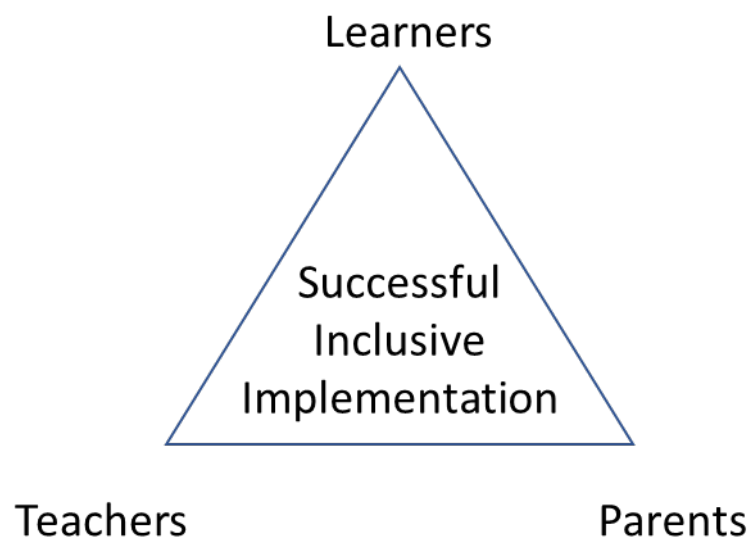


Figure 1. Three important agents of inclusion education: parents, students and teachers.

For each of the three distinct populations - parents, teachers and students - , the project collects data using different scales, based on past research. For example, to investigate parent attitudes, the research uses scales which have been developed and tested relatively recently (for example, see Schueler et al., 2014).

## Section 3 – Data and Methods

### Aims and Objectives

This study aimed to:

- a) validate the *Parents' Perception of Inclusion Climate Scale* Inclusion Climate Scale (PPICS) in the context of secondary schools in Plymouth, England
- b) compare its findings with some of the findings of similar efforts, such as Schueler et al. (2014).

The study is important as it assesses the validity and reliability of the scale in the context of Plymouth where it is to be used, with possibly the prospect of piloting it in different schools in England at a later stage. Unfortunately, it was not possible to identify other similar studies, beyond Schueler et al., 2014, in a similar context, with which to compare the findings of our analysis.

### Data and Methods

#### The questionnaire

The scale consists of 30 items (see Appendix 1) probing the attitudes of parents regarding their perception on the inclusion climate of their children's school. The instrument uses a four-step scale: 1. Not at all true, 2. Slightly true, 3. Very true, 4. Completely true.

Some of the items are negatively worded:

- Item 3: I wish my child was in a different school.
- Item 22: My child's teachers are not very keen with teaching students who are shy and withdrawn
- Item 26: My child has been bullied by other students in this school.
- Item 27: Teachers are not interested in teaching students who ask too many questions.

Items with negative wording need to be reversed back to a positive statement (e.g. "My child's teachers are very keen ..." so as not to have negative correlations with the other items of the scale. Sometimes, negatively worded items may also be difficult for individuals to comprehend and respond to.

The questionnaire was constructed online using JISC. A link to the online questionnaire was distributed to schools, which disseminated these to their Year 7 and Year 10 students. Online questionnaires were initially set to be open for two weeks. During the first two weeks, take-up was relatively slow, so the online surveys were kept open for a further two weeks. To encourage participation weekly reminders were built into the process, using Dillman's Tailored Design Method (2014), which proved effective.

Schools decided on how best to give students access to the online questionnaire via computer; some did so in tutor groups using the ICT suite, others facilitated the completion en masse with whole year groups at a time, while others offered it to single students at a time that suited them. A school staff was present to check if students needed any help with the questionnaire, as well as observe if any of the respondents was experiencing distress and act accordingly. All responses were anonymous.

As regards the analysis, we used EFA to reveal the underlying factors in the data. We did not remove the negatively worded items before the analysis. Due to the ordinal nature of the scale “1. Not at all true” to “4. Completely true”, we used polychoric correlations to compute the correlation matrix for the EFA.

For the analysis, we used the R platform (R Core Team, 2021). For the computation of Cronbach’s alpha, item discrimination indices and EFA we used the psych package (Revelle, 2021). The reliability analysis and EFA were conducted using a sub-sample of 361 parents who gave responses to all 30 items of the scale (37 parents yielded one or more missing responses). To identify the number of factors to extract we used Parallel Analysis and cross-checked our findings with the Velicer MAP and Very Simple Structure techniques (Revelle & Rocklin, 1979).

## Interviews

The interview schedule was designed using cognitive testing. Cognitive testing is ‘*an evidence-based, qualitative method specifically designed to investigate whether a survey question—whether attitudinal, behavioral, or factual in nature—fulfils its intended purpose*’ (Willis & Artino, 2013,p.X). During cognitive testing interviewers are empirically trying to understand the mental process through which individuals process and respond to items (Willis, 2009).

Tourangeau’s (1984) 4-stage cognitive model was followed to develop the interview schedule, which includes: 1. Comprehension; 2. Retrieval of information; 3. Judgment or estimation; and 4. Selection of a response to the question. Additional questions were also asked relating to the layout, navigation and structure of the questionnaire, and its functionality. (The short timeframe for the completion of this study, inhibited us from conducting the interviews after the statistical analysis was completed and follow up on items identified problematic based on that analysis.)

Before the interviews, interviewees took part in a one-hour training session led by the project lead. The aim of the training was to support a consistent way to interviewing. Amongst other, during the training, team members discussed the interview schedule in a systematic way - resolved comprehension challenges, discussed the ordering the questions and the approach to interviewing, identified priority questions, and agreed focus and timings.

The scope of the study allowed for a total of three interviews. To identify the potential sample, the final question of the questionnaire asked respondents for their email address if they consented to being part in the interviews; of the 907 questionnaire respondents, 453 provided their email address. These students were contacted by the research team via their school email address to confirm participation and, of

those who responded first, we posed two selection criteria: that the sample covered Year 7 and Year 10 students and that these students attended different schools.

Interviews lasted 30 minutes and were conducted online using Teams. Priority was given to the cognitive testing questions. During the interviews, the questionnaire items were shown on screen and read out by the interviewers. A hybrid method of interviewing was used: speak-aloud and probing.

With interviewees permission, all interviews were audio-recorded. The interviewers made notes throughout too. Final notes were typed and the interviewer manually coded the data and identified key themes. A summary of the student data was sent to the other two members of the research team, who were using the same interview schedule with parents and teachers who filled in the relevant inclusion questionnaire for their 'respondent group'. When summaries of the data for all the respondent groups were completed, a group analysis session took place. During the analysis session the research team familiarised itself with all the data and further analysed the data further for each respondent group and across groups. Because each interviewer had been allocated a specific respondent group, the team analysis provided differing perspectives and the ability to prompt each other to critically reflect upon the analysis completed by individual interviewees and revisions to the original themes to take place, which, in turn, supported the validity of the results.

## The sample

Overall, 398 parents of students from 10 schools in the Plymouth area took part in the study. About 60% of the respondents were at the age range of 40-49. The rest were approximately evenly distributed in lower and upper age ranges (e.g. 15% in the age range 30-39 and 23% in the age range 50-59). Eight out of ten respondents were women. Around 60% of the respondents answered that their child at school was a boy.

## The procedure

All 19 secondary schools in the city of Plymouth were invited to take part in the study. At the outset, the research team briefly introduced the study in one of the regular Headteachers' meetings convened by the Plymouth Education Board (PEB), part of Plymouth Council. Schools interested to find out more details about the study were invited to a separate meeting with the research team. During that meeting, amongst others, the research team provided detailed information about the study and answered questions. As a follow up, schools received written notes from the meeting and, at that stage, were asked to formally express their interest in taking part in the project. A total of 10 secondary schools, 9 secondary schools and one alternative provision voluntarily agreed to take part in the project.

After schools' self-selection was completed, an information pack was sent to them. Relevant information was passed to parents by the schools. Parents were asked to provide their consent before completing the questionnaire and were also informed that they could withdraw from the study at any point. Withdrawal from the study as a whole was possible until July 2022, when the analysis phase began. Before the study began, ethical approval by the ethics panels by Plymouth Marjon University's ethics panel was sought.



## Section 3 - Results

### Descriptive statistics

Initially, we inspected the frequency distributions for all 30 items of the scale (see Appendix 2). Some of the items seem to demonstrate less variance than others. For example, Item 3 (“I wish my child was in a different school”) has limited variance as almost all of the responses given were '1 Not at all true'. The same holds true for item 27 (“Teachers are not interested in teaching students who ask too many questions”). Other items demonstrate much higher variance and respondents utilized the whole range of the scale. For example, item 14 (“My child is happy to be at school”) received responses across the whole range of the scale 1-4. Items with very little variance often do not correlate satisfactorily with other items and as a result may not be included in common factors during the EFA.

### Item inter-correlations

First, we reversed items 3, 22, 26, 27 to avoid artificially inducing negative correlations between the items. Figure I presents the correlogram of the polychoric correlations between the 30 items of the PPICS. The reversed items 3, 22, 26, 27 have very low correlations with most of the items. We decided to remove these negatively worded items from the preliminary EFA analysis.

Figure I also suggests that certain items have particularly low correlations with many of the items. For example, it was decided that items 19 (“My child’s classmates invite him/her to go out socially (e.g. birthday parties)”) and 26 (“My child has been bullied by other students in this school.”) will be dropped from further analysis.

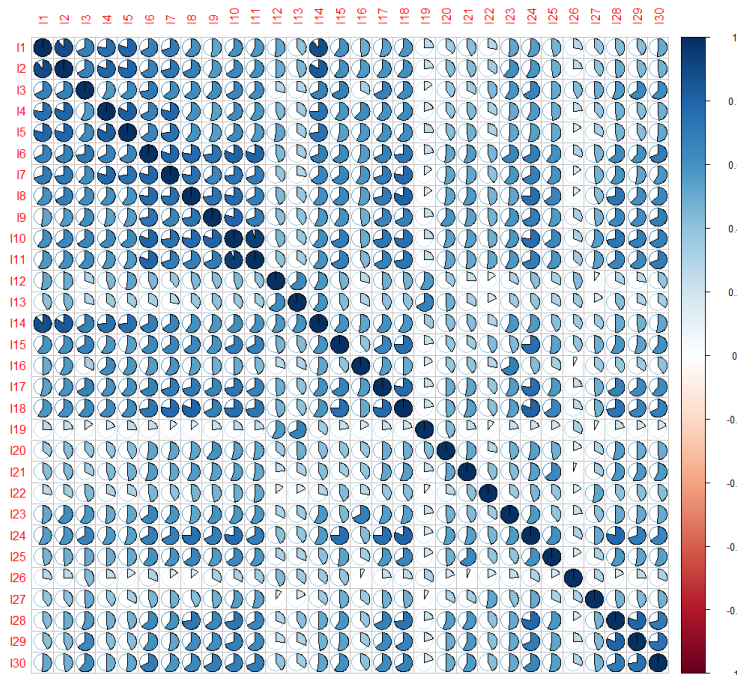


Figure 2. Correlogram of polychoric correlations between the 30 items of the PPICS. Larger proportion of shaded pie-charts (and darker shade) represent larger correlations.

## The factor structure

A Parallel Analysis on the remaining 25 items (after removing the four negatively worded items and item 19), suggested the extraction of between 2 and 6 factors (but factors 3 to 6 have particularly low eigenvalues). VSS complexity 2 achieved a maximum of 0.77 with 2 factors. Similarly, Velicer MAP achieved a minimum of 0.03 with 2 factors. A scree plot suggested the extraction of 2 factors with an eigenvalue above 1.

We decided to run a preliminary EFA with 2 factors, and oblimin rotation as we do not have strong reasons to believe that the factors should be uncorrelated. The results are shown in Appendix 3. Items 6, 7, 13, 15, and 23 have sizeable and similar loadings on two factors, so they were dropped from further analysis and the factor analysis was re-run.

The results of the second EFA are shown in Appendix 4. The EFA analysis yielded two factors. The first factor consists of 13 items: 8, 9, 10, 11, 17, 18, 20, 21, 24, 25, 28, 29, 30. All of the items explicitly refer to teachers e.g, “My child’s teachers give him/her...” except item 25 (“When my child is not feeling well, he/she can talk to someone at school”) which refers to the ‘school’. The wording of item 25 suggests that the parents may have understood that ‘school’ in this context refers to teachers because when the child does not feel well, he/she would probably be expected to talk to a teacher. We suggest that the name ‘Teacher support and care’ is an appropriate name for this set of items.

### Items in factor I: ‘Teacher support and care’

8. Teachers and other staff in this school are friendly to my child
9. My child’s teachers give him/her positive feedback when they do well at school
10. The majority of teachers in my child’s school are interested in teaching students who struggle with their learning
11. Teachers in my child’s school ensure that students, who face difficulties in learning a subject, receive enough support and guidance
12. Teachers in my child’s school ensure that all students are included in the majority of school activities
13. Teachers in my child’s school are caring and compassionate toward all students
14. My child’s teachers set high expectations, and want him/her to work hard and do well
15. My child has at least one teacher/adult in his/her school whom he/she can contact if he/she is facing any difficulties
16. Teachers and school staff treat all students with respect at my child’s school
17. When my child is not feeling well, he/she can talk to someone at school
18. Teachers are respectful in the way they interact with parents and siblings of all students
19. The educators in the school ensure that I feel welcome as a parent
20. The school is proactive in addressing any concerns I may have about my child

The second factor consists of 7 items: 1, 2, 4, 5, 12, 14, 16. All items refer to how the child feels when at the school and how the child experiences the school life. We suggest that the heading ‘Emotional Experience’ is an appropriate name for this set of items.

### Items in factor II: 'Emotional Experience'

1. My child enjoys going to school every day
2. My child enjoys attending most of the classes
4. My child finds the majority of lessons in his/her school interesting
5. My child looks forward to participating in various classroom activities
12. Most other students in my child's class like him/her
14. My child is happy to be at school
16. My child tries do his/her best in all subjects

Interestingly, the factors 'Emotional Experience' and 'Teacher support and care' are highly correlated ( $r=0.68$ ). Interestingly, the results look surprisingly similar to those of the EFA for the student ICS which may suggest that children and parents may have a very similar conceptualization of what inclusion climate is at school.

### Factor Analysis

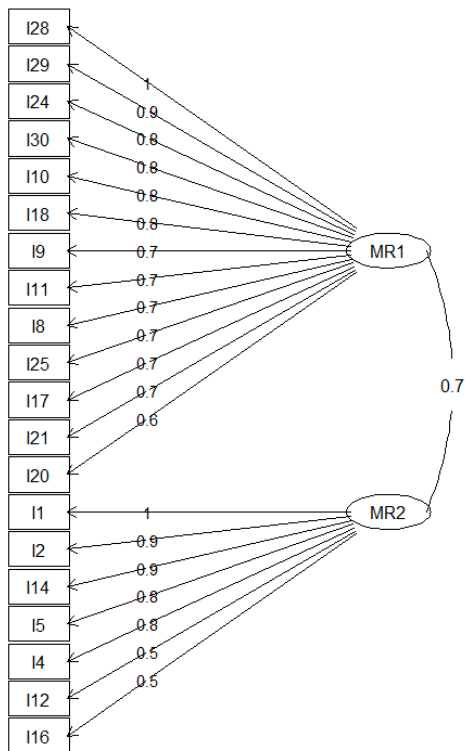


Figure II. The factor structure of the scale.

It is important to note that other rotations (e.g., an orthogonal varimax rotation) yield the same structure with similar loadings. This suggests that our decision to use the oblimin rotation has not affected our findings.

## Reliability and Discriminating power of items

For each of the two factors, we computed Cronbach's alpha. The Cronbach's alpha for the first factor ('Teacher support and care'), based on polychoric correlation matrix, was 0.96. The corrected item-total correlation for the items of the factor ranged from 0.64 to 0.91 which is satisfactory for all intents and purposes, suggesting that all items contribute significantly to the measurement exercise. The average inter-item correlation was 0.65 which is very satisfactory and is another indication of high internal consistency for the factor.

The Cronbach's alpha for the second factor ('Emotional Experience'), based on polychoric correlation matrix, was 0.93. Corrected item-total correlations range between 0.56 and 0.92 which is very satisfactory, suggesting that all items contribute significantly to the measurement exercise. The average inter-item correlation is similar to that of factor I, with a value of 0.65, which is very satisfactory and is another indication of high internal consistency for the factor. An average inter-item correlation of this value is well within the recommendations of Clark & Watson (1995) and is another indication of the reliability of the PPICS.

Overall, the two factors seem to have very satisfactory reliability indices and high inter-item correlations.

## Analysis of interviews

### Comprehension

Overall, interviewees reported to have understood all items with relative ease. There were some suggestions however about some terminology that might not be very familiar to respondents. One interviewee suggested to replace the word 'support' used in item 11 with the word 'intervention' which is probably used in Plymouth schools, alongside the word 'support'. In some other cases, interviewees suggested to add extra info in brackets to explain what is meant by the terminology re. SEND and to add info about whether child has diagnosis, or have suspected needs – as not all children have EHCP which is included as an option.

### Information retrieval

No challenges with information retrieval were reported.

### Judgment / Response

Items 7, 8, 10, 11, 12, 17, 18, 24, 27, 28 were seen relatively problematic by all interviewees. These items ask parents to report on their views about all pupils and teachers in their child's school. Parents interviewed suggested that they were not aware of what other teachers and/or pupils in the school were experiencing and thus were not confident about the 'accuracy' of their answers and, overall, found these items hard to be asked '*making such generalisations*'. This led one interviewee to suggest that, at least for these items, an option for 'unsure' / 'don't know' should be added.

## Timing

The questionnaire took between 10 and 15 minutes to complete, interviewees reported. They agreed that completing the questionnaire was time well spent and that they would be happy to re-invest that time to complete the questionnaire again in the future.

## Layout and structure / Functionality

Overall, interviewees agreed that the functionality (computer and ipad), layout, navigation and structure of the online questionnaire were relatively unproblematic.

## Triangulating qualitative and quantitative data

As it has already been indicated by the quantitative analysis, some of the items of the PPICS may have certain shortcomings. For example, some of the items were negatively worded, so they had to be 'reversed'. These items were removed from the analysis as they had small correlations with other items in the questionnaire.

Interview data also suggested that some terminology might not be very familiar to the respondents (e.g. 'support', see item 11). In some other cases, interviewees suggested to add extra info in brackets to explain what is meant by the terminology re. SEND – also to add info about whether child has diagnosis, or have suspected needs (not all have EHCP). However, it is very important to note that if we proceed with changes in the wording of the items (or if we add brackets with explanatory text), the instrument may need to be re-piloted, which could result to extra cost and delays.

Consideration could be given to items 7, 8, 10, 11, 12, 17, 18, 24, 27, 28 which ask parents to report their views for pupils and teachers across the school. In future versions of the instrument, these items may need to be rephrased, deleted or replaced.

## Section 4 – Summary of Recommendations

Some of the items of the PPICS are not needed and might be removed from future administrations of the instrument (Items 3, 6, 7, 13, 15, 19, 22, 23, 26, 27). These items are neither necessarily of bad quality, nor redundant. Some of them, if they are of academic or practical interest, could be retained in the questionnaire. However, removing these items, would shorten the scale which would save a significant amount of time for the respondents (i.e., the parents). Removing items would also make the shorter questionnaire more appealing to complete, and would reduce the analysis time needed. Removing the items does not lead to significant loss of information, but would yield a more compact and solid instrument with two factors.

For purposes of further analysis, we recommend to aggregate two 'scores' for each parent, based on the two factors revealed: 'Emotional Experience' and 'Teacher support and care'. These scores could be used to investigate differences between groups with different demographic characteristics or between schools etc.

If changes are attempted on the wording of items, the instrument would need to be re-piloted and re-evaluated for its psychometric characteristics.

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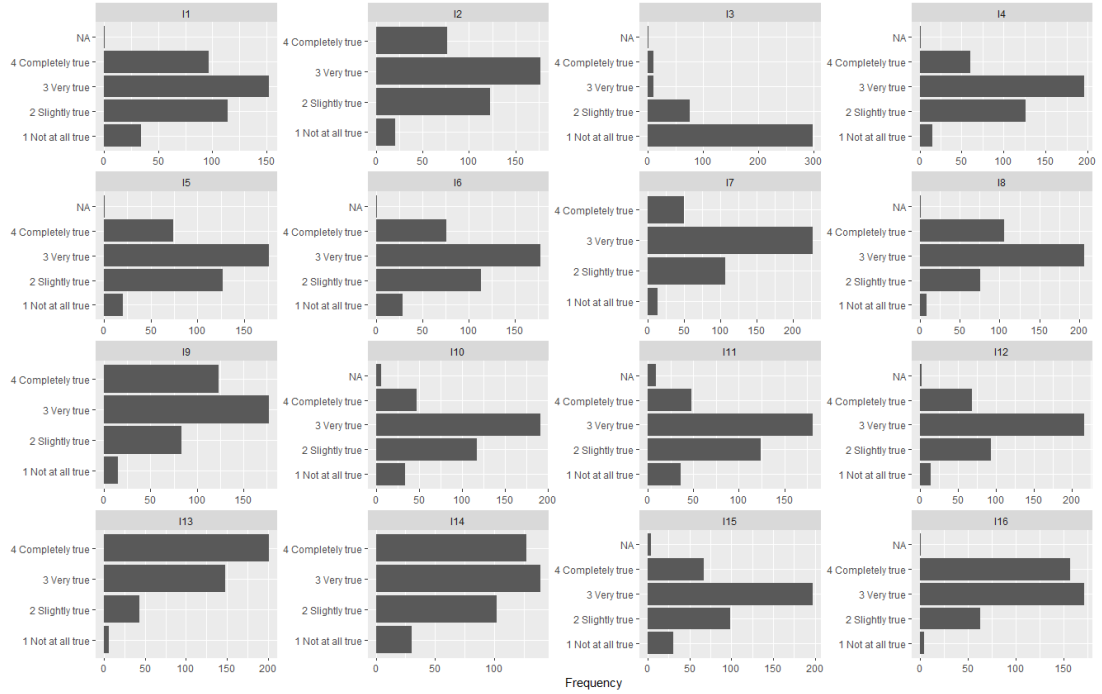


# Appendices

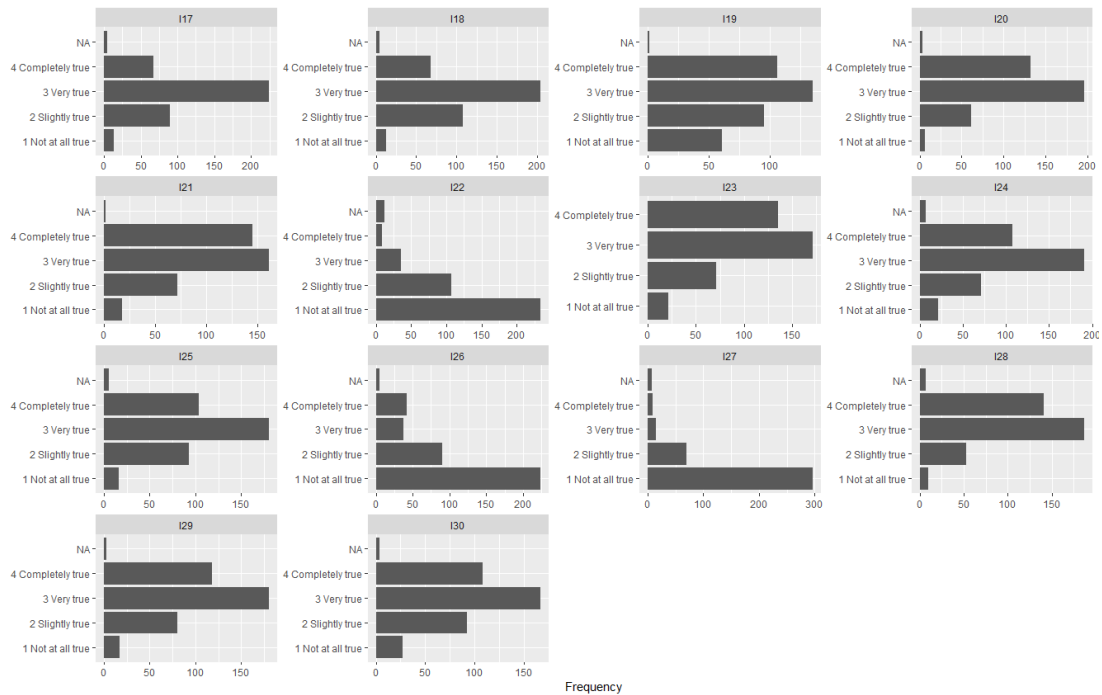
## Appendix 1- The instrument

- [1] "My child enjoys going to school every day."
- [2] "My child enjoys attending most of the classes."
- [3] "I wish my child was in a different school."
- [4] "My child finds the majority of lessons in his/her school interesting."
- [5] "My child looks forward to participating in various classroom activities."
- [6] "My child receives sufficient help from teachers/school staff when he/she needs it."
- [7] "Most teachers in my child's school create engaging and enjoyable lessons."
- [8] "Teachers and other staff in this school are friendly to my child."
- [9] "My child's teachers give him/her positive feedback when they do well at school."
- [10] "The majority of teachers in my child's school are interested in teaching students who struggle with their learning."
- [11] "Teachers in my child's school ensure that students, who face difficulties in learning a subject, receive enough support and guidance."
- [12] "Most other students in my child's class like him/her."
- [13] "My child has at least one friend in his/her school who cares about him/her."
- [14] "My child is happy to be at school."
- [15] "My child's teachers are fair when a student misbehaves in the class."
- [16] "My child tries do his/her best in all subjects."
- [17] "Teachers in my child's school ensure that all students are included in the majority of school activities."
- [18] "Teachers in my child's school are caring and compassionate toward all students."
- [19] "My child's classmates invite him/her to go out socially (e.g. birthday parties)."
- [20] "My child's teachers set high expectations, and want him/her to work hard and do well."
- [21] "My child has at least one teacher/adult in his/her school whom he/she can contact if he/she is facing any difficulties."
- [22] "My child's teachers are not very keen with teaching students who are shy and withdrawn."
- [23] "I am satisfied with my child's achievements at school in most of his/her subjects."
- [24] "Teachers and school staff treat all students with respect at my child's school."
- [25] "When my child is not feeling well, he/she can talk to someone at school."
- [26] "My child has been bullied by other students in this school."
- [27] "Teachers are not interested in teaching students who ask too many questions."
- [28] "Teachers are respectful in the way they interact with parents and siblings of all students."
- [29] "The educators in the school ensure that I feel welcome as a parent."
- [30] "The school is proactive in addressing any concerns I may have about my child."

## Appendix 2 – Frequency distributions per item



Page 1



Page 2

Note: 'NA' represents missing responses

## Appendix 3 – Preliminary Exploratory Factor Analysis

Loadings:

	MR1	MR2
I1		0.942
I2		0.919
I4		0.810
I5		0.822
I6	0.603	0.333
I7	0.459	0.469
I8	0.720	0.189
I9	0.751	
I10	0.807	0.129
I11	0.755	0.124
I12	0.106	0.507
I13	0.207	0.350
I14		0.877
I15	0.552	0.266
I16	0.196	0.498
I17	0.685	0.188
I18	0.776	0.138
I20	0.601	
I21	0.666	
I23	0.403	0.345
I24	0.849	
I25	0.700	
I28	0.984	-0.187
I29	0.951	-0.213
I30	0.826	

	MR1	MR2			
SS loadings	9.094	5.200			
Proportion Var	0.364	0.208			
Cumulative Var	0.364	0.572			
> fa.diagram(poly_model)					
> poly_model					
Factor Analysis using method = minres					
Call: fa(r = d, nfactors = 2, n.obs = nrow(d), rotate = "oblimin",					
fm = "minres", cor = "poly")					
Standardized loadings (pattern matrix) based upon correlation matrix					
	MR1	MR2	h2	u2	com
I1	-0.05	0.94	0.83	0.17	1.0
I2	0.01	0.92	0.86	0.14	1.0
I4	0.08	0.81	0.75	0.25	1.0
I5	0.07	0.82	0.75	0.25	1.0
I6	0.60	0.33	0.75	0.25	1.6
I7	0.46	0.47	0.73	0.27	2.0
I8	0.72	0.19	0.74	0.26	1.1
I9	0.75	0.10	0.68	0.32	1.0
I10	0.81	0.13	0.81	0.19	1.1
I11	0.76	0.12	0.72	0.28	1.1
I12	0.11	0.51	0.34	0.66	1.1
I13	0.21	0.35	0.27	0.73	1.6
I14	0.03	0.88	0.81	0.19	1.0
I15	0.55	0.27	0.58	0.42	1.4
I16	0.20	0.50	0.42	0.58	1.3
I17	0.68	0.19	0.68	0.32	1.2
I18	0.78	0.14	0.77	0.23	1.1
I20	0.60	0.05	0.41	0.59	1.0

I21 0.67 0.00 0.45 0.55 1.0  
 I23 0.40 0.34 0.47 0.53 2.0  
 I24 0.85 0.03 0.76 0.24 1.0  
 I25 0.70 0.02 0.51 0.49 1.0  
 I28 0.98 -0.19 0.75 0.25 1.1  
 I29 0.95 -0.21 0.67 0.33 1.1  
 I30 0.83 -0.03 0.65 0.35 1.0

	MR1	MR2
SS loadings	10.02	6.13
Proportion Var	0.40	0.25
Cumulative Var	0.40	0.65
Proportion Explained	0.62	0.38
Cumulative Proportion	0.62	1.00

With factor correlations of  
 MR1 MR2  
 MR1 1.00 0.69  
 MR2 0.69 1.00

Mean item complexity = 1.2  
 Test of the hypothesis that 2 factors are sufficient.

The degrees of freedom for the null model are 300 and the objective function was 29.39 with Chi Square of 10310.3  
 The degrees of freedom for the model are 251 and the objective function was 6.89

The root mean square of the residuals (RMSR) is 0.05  
 The df corrected root mean square of the residuals is 0.05

The harmonic number of observations is 361 with the empirical chi square 536.05 with prob < 8.9e-23  
 The total number of observations was 361 with Likelihood Chi Square = 2407.79 with prob < 0

Tucker Lewis Index of factoring reliability = 0.741  
 RMSEA index = 0.154 and the 90 % confidence intervals are 0.149 0.16  
 BIC = 929.68  
 Fit based upon off diagonal values = 0.99  
 Measures of factor score adequacy

	MR1	MR2
Correlation of (regression) scores with factors	0.98	0.98
Multiple R square of scores with factors	0.97	0.96
Minimum correlation of possible factor scores	0.94	0.92

## Appendix 4 – Final Exploratory Factor Analysis with 3 factors

Loadings:

	MR1	MR2
I1	0.956	
I2	0.921	
I4	0.812	
I5	0.836	
I8	0.709	0.205
I9	0.742	0.109
I10	0.789	0.154
I11	0.731	0.144
I12	0.123	0.484
I14	0.860	
I16	0.203	0.477
I17	0.678	0.198
I18	0.760	0.153
I20	0.612	
I21	0.669	
I24	0.831	
I25	0.689	
I28	0.979	-0.170
I29	0.940	-0.187
I30	0.810	

	MR1	MR2
SS loadings	7.805	4.553
Proportion Var	0.390	0.228
Cumulative Var	0.390	0.618

Factor Analysis using method = minres

Standardized loadings (pattern matrix) based upon correlation matrix

	MR1	MR2	h2	u2	com
I1	-0.05	0.96	0.85	0.15	1.0
I2	0.02	0.92	0.87	0.13	1.0
I4	0.08	0.81	0.75	0.25	1.0
I5	0.06	0.84	0.78	0.22	1.0
I8	0.71	0.21	0.74	0.26	1.2
I9	0.74	0.11	0.67	0.33	1.0
I10	0.79	0.15	0.81	0.19	1.1
I11	0.73	0.14	0.70	0.30	1.1
I12	0.12	0.48	0.33	0.67	1.1
I14	0.05	0.86	0.80	0.20	1.0
I16	0.20	0.48	0.40	0.60	1.4
I17	0.68	0.20	0.68	0.32	1.2
I18	0.76	0.15	0.76	0.24	1.1
I20	0.61	0.04	0.40	0.60	1.0
I21	0.67	0.01	0.46	0.54	1.0
I24	0.83	0.05	0.75	0.25	1.0
I25	0.69	0.04	0.52	0.48	1.0
I28	0.98	-0.17	0.76	0.24	1.1
I29	0.94	-0.19	0.68	0.32	1.1
I30	0.81	-0.01	0.64	0.36	1.0

	MR1	MR2
SS loadings	8.30	5.04
Proportion Var	0.41	0.25
Cumulative Var	0.41	0.67
Proportion Explained	0.62	0.38
Cumulative Proportion	0.62	1.00

With factor correlations of  
MR1 MR2  
MR1 1.00 0.68  
MR2 0.68 1.00

Mean item complexity = 1.1  
Test of the hypothesis that 2 factors are sufficient.

The degrees of freedom for the null model are 190 and the objective function was 22.15 with Chi Square of 7809.43  
The degrees of freedom for the model are 151 and the objective function was 4.01

The root mean square of the residuals (RMSR) is 0.04  
The df corrected root mean square of the residuals is 0.04

The harmonic number of observations is 361 with the empirical chi square 196.41 with prob < 0.0076  
The total number of observations was 361 with Likelihood Chi Square = 1406.59 with prob < 1.8e-202

Tucker Lewis Index of factoring reliability = 0.792  
RMSEA index = 0.152 and the 90 % confidence intervals are 0.145 0.159  
BIC = 517.37  
Fit based upon off diagonal values = 1  
Measures of factor score adequacy

	MR1	MR2
Correlation of (regression) scores with factors	0.98	0.98
Multiple R square of scores with factors	0.97	0.96
Minimum correlation of possible factor scores	0.93	0.92