

# Validation of a self-efficacy survey for Italian midwifery students with regard to breastfeeding support

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## Abstract

*Background:* The training of midwives is critical in order to acquire the professional skills necessary in the support of breastfeeding. The use of tools that demonstrate student competency in the field of midwifery is fundamental.

*Objectives:* The aim for this study was to translate and apply a questionnaire to an Italian cohort of students – determining their self-efficacy and establishing the validity of the tool collectively.

*Design:* This study was a descriptive cross-sectional study.

*Setting:* The study was conducted at a large university in northern Italy.

*Participants:* Seventy-six female students from the Midwifery Degree Course.

*Methods:* The questionnaire translated into Italian was administered to students participating in a Midwifery Degree Course. Rasch analysis was applied using ConQuest software, version 4.

*Results:* Seventy-six questionnaires were collected. Fifty-six questionnaires have modal value 3 of the Likert response scale (It's easy for me to do it), 17 have a mode of 4 (It's very easy for me to do it), 3 of 2 (It's difficult for me to do it) and no questionnaire of 1 (It's very difficult for me to do it). A questionnaire identified the perception of self-efficacy of midwifery students in assisting breastfeeding mothers.

*Conclusion:* The results of this research demonstrate that students of midwifery consider themselves competent when assisting breast feeding mothers.

## **1. Introduction**

Midwives are responsible for providing both information and assistance with regard to infant feeding (Renfrew et al., 2014). Global health organizations provide recommendations for the protection of breastfeeding (Unicef, 2010; Ministry of the Italian Republic, 2014; WHO, 2009). In Italy breastfeeding is below official recommendations (Unicef, 2010; ISTAT, 2018); therefore, knowledge and support capabilities in breastfeeding are a fundamental part of midwifery education (Yang et al., 2018). Practical skills and knowledge were examined in the given literature, but competence consists also of motivation and self-perception, which can be measured using “latent trait models” (Wolfe, 2004). Using a Rasch analysis based questionnaire, an Australian study investigated midwifery students’ perception of self-efficacy (Bandura, 1986) in the support of breastfeeding mothers (Blackman, Sweet & Byrne, 2015). In such cases a questionnaire exploring the perception of self-efficacy (Ward & Byrne, 2011) would be useful as existing questionnaires measure both theoretical and technical skills. The perception of self-efficacy for a health worker is considered important as it demonstrates a level of professional development (Natan et al., 2018).

The World Health Organization states that breastfeeding education for healthcare professionals, especially midwives, is a significant factor in the protection and support of breastfeeding (WHO, 2004). A systematic review of the literature, strongly recommend detailed preparation for both doctors and midwives that consider “The Ten Unicef - WHO Steps for breastfeeding”, in the context of the Unicef Baby Friendly Initiative (Burgio et al., 2016). According to Healer (2015) to achieve adequate expertise in assisting breastfeeding, a complete and thorough knowledge of the physiology and emotions that underlie the art of breastfeeding is necessary.

Meek (2017) shows a significant need for improvement in the training of health professionals with regard to breastfeeding. Renfrew et al (2006) brought to light deficiencies in training, underlining a deficit in both the knowledge and skills of health professionals in all sectors. Renfrew et al (2006) and Ward & Byrne (2011), indicate that the lack of adequate facilities and the lack of importance attributed to breastfeeding socially, were identified as potential obstacles in effective component

training. It was also found that health professionals, including midwives, feel unprepared when it comes to breastfeeding support; respondents claimed to have limited education in anatomy and physiology of the breast, while the ability to support and manage clinical problems was acquired only in the workplace (Renfrew et al., 2006; Ward & Byrne, 2011).

According to the evidence, a theoretical knowledge in breastfeeding for healthcare professionals is predictive of behavior and mental attitude of support, but this knowledge must be accurate and complete in order to facilitate the effective promotion of breastfeeding (Bernaix, 2000). To evaluate the theoretical knowledge and practical support concerning breastfeeding, different questionnaires were developed in time. One of the first questionnaires used in the United States was the Breastfeeding Knowledge Questionnaire (BKQ) (Freed et al., 1995). Initially the BKQ was used in the United States, where a lack of theoretical knowledge, as well as skills of doctors and other health professionals in supporting breastfeeding, emerged (Freed et al., 1995). A subsequent study of nursing students showed that they also did not have adequate knowledge when it came to effectively supporting breastfeeding (Freed, Clark, Harris & Lowdermilk, 1996).

Although this study proved that education in the area of breastfeeding was ineffective, about 75% of nursing students were sure of their skills with 69% judged effective in the helping of breastfeeding (Freed, Clark, Harris & Lowdermilk, 1996). The BKQ has been used in Australia to investigate the knowledge of breastfeeding among midwives registered to the Australian College of Midwives: the theoretical knowledge has been judged satisfactory overall, but specific impairments such as breast abscess management were identified (Cantrill, Creedy & Cooke, 2003). Despite these specific deficits, 90% of the sample said they were "safe and effective" in supporting breastfeeding (Cantrill, Creedy & Cooke, 2003). Other existing questionnaires designed to investigate the theoretical and practical knowledge regarding breast-feeding are the Newborn Ability (NFA) and the Breastfeeding Initiation Practices (BIP) (Creedy, Cantrill & Cooke, 2008).

One study administered the NFA and the BIP questionnaires to 3,500 midwives and, according to the results, the combination of these two tools is valid when used to identify the theoretical and

practical training needs of midwives (Creedy, Cantrill & Cooke, 2008). A quasi-experimental US study has proposed, for student nurses, a training program structured into 10 hours of lectures and 8 weeks of practical training within a perinatal department: there was an improvement of theoretical knowledge as students were more likely to associate breastfeeding with better maternal-neonatal outcomes, but there were no differences noted in the attitude towards breastfeeding or formula feeding between control and intervention groups. Therefore, it seems that with regard to attitudes, personal opinions and student behavior they have not been affected, with effects noted only in areas of theoretical knowledge (Dodgson & Tarrant, 2007). Similar findings were reported also by Ormrod (Ormrod, 2014).

It emerges from the literatures that it is difficult to propose training that can influence both attitudes and self-perception when it comes to breastfeeding support. In an effort to bridge this gap, Blackman, Sweet & Byrne (2015) explored these issues by adding to the current perspective, the use of the self-efficacy concept for training. Self-efficacy is the degree or strength of an individual's confidence in their ability to learn or implement behaviors to accomplish tasks and achieve goals (Ormrod, 2014).

The concept of self-efficacy was developed by Bandura's studies, which proposed that self-efficacy levels correspond to the expectation of being able to learn and consequently master taught abilities. Consequently, the perceived ability of the individual will be an important factor in influencing the choice of engagement in the achievement of a given goal. People who perceive a task as difficult or out of reach will avoid participating in the learning process. On the contrary, those who see an opportunity to learn positively, since they perceive no threat, are seen to learn more effectively (Bandura, 1986). The authors of the aforementioned article have adapted an aptitude test on self-efficacy, originally addressed to breastfeeding women (Dennis, 2003), to use in midwifery degrees. Gathering information in an educational setting by analyzing test results that investigate self-efficacy, can enable the estimation of the intensity, direction, and consistency of thoughts and feelings toward certain values and convictions. The questionnaire adapted for midwifery students is

an effective tool when inquiring into the perception of their ability to be professionally involved in teaching, supporting and supervising breastfeeding women. Thanks to the results obtained, it is possible to structure needs-oriented educational interventions. The Rasch analysis, applied in the study Blackman, Sweet & Byrne (2015), allows users to statistically investigate the reliability of psycho-attitude tests in identifying different levels of the so called: non explicit trait or not visible trait or 'latent trait' involved.

In the global effort to improve education and training of health professionals in breastfeeding, the possible accreditation of degree courses such as "*Breastfeeding Friendly*" as part of the Unicef Baby Friendly Initiative (BFI) arises. Testing the achievement of requirements for accreditation can be useful when assessing the level of self-efficacy that students consider they have when it comes to mastering each skill taught. The five steps for the "*Breastfeeding Friendly degree course*" are outlined in Table 1.

## **2. Methods**

### *2.1. Study Design*

This study was a descriptive cross-sectional study.

### *2.2. Setting*

Midwifery students from the University of Milan, based in Milan and Mantua utilised 34 questions of an Australian questionnaire, originally composed of 37 questions in order to test self-efficacy (Blackman, Sweet & Byrne, 2015) in the assisting of breast feeding mothers. The original survey items and items deleted are reported in Table 2.

### *2.3. Sample*

The questionnaire was administered to seventy-six female students. Thirty-eight students were in their 2<sup>nd</sup> year and thirty-eight students were in their 3<sup>rd</sup> year of a degree course (academic year

2016-2017). The midwifery degree course of the University of Milan has two different locations, one in Milan and the other in Mantua, made up of twenty-five students in Milan and thirty in Mantua. All of these had completed their education concerning breastfeeding. Contents and training activities for students to meet the standards set by the WHO / Unicef 20-hour course (WHO, 2009) and are in line with the Phase 2 assessment of Unicef Baby Friendly Initiative accreditation of the degree course.

#### *2.4. Instrument*

The original questionnaire was translated into Italian, slightly modified and updated in line with the guidelines (WHO, 2009). Items 19, 24 and 37 of the original questionnaire have been excluded, because whilst Blackman, Sweet & Byrne (2015) suggested rewording them to contemporary practice, we deemed them not necessary for hospital trained Italian students assisting women during hospitalisation.

The translation from English to Italian and vice versa has been viewed by two mother tongue speakers, one English and one Italian. The questionnaire consists of 34 items answered by ticking the box corresponding to meanings with Likert Scale values from 1 to 4. The attribution of values / meanings is as follows: 4 = It's very easy for me to do it; 3 = It's easy for me to do it; 2 = It's difficult for me to do it; 1 = It's very difficult for me to do it.

#### *2.5. Data collection*

Participation in the study was voluntary. Questionnaires were distributed in paper form during school hours. The questionnaires were completed by hand. Confidentiality and anonymity were both guaranteed during the compilation of data.

#### *2.6. Data analysis*

For analysis of the data, an Excel file was generated, matching the ID number of each questionnaire to the answer given to each item of the questionnaire, using a number from 1 to 4. The validity of the Italian questionnaire was verified applying the Rasch analysis using ACER ConQuest software version 4. From the output of the Rasch analysis, we have chosen to underline the following. The Item Characteristic Curve (ICC) shows the probability of a correct response as a function linked to the ability of persons involved.

The model-expected item characteristic curve, also called ESC (Expected Score Curve) or IRF (Item Response Function), shows the Rasch-model prediction for each measure relative to item difficulty. Its shape is ascending monotonic, and is used for inference. In fact, if one knows the score on the item, the ability of the person responding may be inferred. Conversely, one can infer the expected score on the item, by knowing the ability of the person responding.

Moreover, results of the general analysis given by the Rasch model were provided. In particular, a chi-squared statistic divided by its degrees of freedom (MNSQ) is used to test overfit/dependency data (values substantially less than 1.0) and underfit/unmodeled noise (values substantially greater than 1.0). An information-weighted version of MNSQ was used, which is more sensitive to unexpected behavior affecting responses to items near the person's measure level. Finally, the Rasch person-item map is used during exploratory data analysis.

### *2.7. Ethical Approval*

The Ethics Committee of the Università degli Studi di Milano (Milan, Italy) approved the study with the Report 11th July 2017 – attachment 6 – number 28/17.

## **3. Results**

Seventy-six questionnaires were collected, of which 49 came from the Milan section and 27 from Mantua; all 2<sup>nd</sup> and 3<sup>rd</sup> year students, from both sections, completed the questionnaire. Filling in the questionnaire took about 15 minutes. This data generated: Item Characteristic Curve (ICC graphics)

and Expected Score curves (ESC) for each item, the Infit Mean Square Index (MNSQ) per item, the general analysis of the parameters of each item and the map of the distribution of skills in relation to the difficulty of the item. Fifty-six questionnaires have modal value 3 of the Likert response scale (It's easy for me to do it), 17 have a modal of 4 (It's very easy for me to do it), 3 of 2 (It's difficult for me to do it) and no questionnaires of 1 (It's very difficult for me to do it).

According to the analysis of the General Estimates of the parameters of each item all items except one (Item 34) are reliable evaluators in discriminating the different perceptions of self-efficacy of midwifery students in supporting breastfeeding mothers in the context of this questionnaire. Table 3 shows the General Estimates of reliability for each item. The Rasch analysis enables the identification of response patterns within the variability limits for the population. Item-Total Correlation is a parameter that expresses the compatibility of responses to a single item with the pattern identified: the higher the value of the Item-Total Correlation, the greater the compatibility and therefore the reliability of the item. Table 3 shows the Item-Total Correlation values for each item. All items have an Item-Total Correlation value greater than the minimum limit identified by Wu (2007), which is 0.3; so they are all reliable considering this parameter.

The ICC graphs generated for each item are constructed considering the level of the latent trait (self-efficacy perception) on the abscissa axis and the probability of selecting a certain category of Likert scale on the ordinates. Infit indices, in particular MNSQs for this analysis, indicate the degree of ability of the item to discriminate between individuals with a high or low level of latent trait. A reliable item will establish a mathematical function characterized by an increase in the overall score of the item by increasing the latent trait level. The more an MNSQ is close to the value 1 plus the more the performance of the function is similar to the ideal one.

The ESC graphs generated for each item are constructed considering the level of self-efficacy perception on the abscissa axis and the Likert scale on ordinates.-ACER ConQuest software made it possible to structure a map of perceived self-efficacy and item difficulty (Figure 1). Figure 1 has a vertical line: to the left of the line, the X represents each 0.5 students, to the right of the line are the

item numbers of the questionnaire (called the Item Difficulty Scale). At the far left of the chart, the linear scale ranging from -4 to +5 simultaneously measures the degree of student self-perception and the complexity of perceived items.

As an example we present only Figure 2 for the ICC and Figure 3 for the ESC of item 18 with an Infit Mean Square Index of 1.03. The MNSQ of item 18 has a value corresponding to that of the Australian students, showing a similarity between results coming from two different hemispheres.

#### **4. Discussion**

The Rasch analysis has allowed the validation of the questionnaire in Italian providing a statistically significant method. For this reason, it can be stated that in general the tool can effectively evaluate the perception of self-efficacy of midwifery students in assisting breastfeeding mothers. The results show that midwifery students have, in general, a high level of self-efficacy perception in supporting breastfeeding mothers; indeed, observing the map of the perceived self-efficacy and the difficulty of items (Figure 1) it emerges that the scale values 0/+4 represent more than two-thirds of the “X”. The total scores are high considering the possible minimum and maximum and the mode of the answers is 3 (“It's easy for me to do it”).

Comparing the results of our research with that of the Australian (Blackman, Sweet & Byrne, 2015), referring to Table 4, it is evident that all students perceive their self-efficacy as being between the values of -2 and +4. In addition, Figure 1, shows that both Italians and Australians recognise the need for a high level of self-efficacy in situations considered more difficult, indicated in items 23/22 and 20/19 of Table 2. At the same time students recognise a lesser level when it comes to situations considered less demanding, indicated in items 15 and 25/23 of Table 2. As opposed to Australian students, the Italians feel the need for a high level of self-efficacy in situations considered difficult expressed in items 25/23 and even more in items 27/25. Items 27/25: “Provide mother with strategies to meet her baby’s breastfeeding demands” help to address the studies of Italian students in order to make them bolder when supporting breast feeding mothers.

We saw that midwifery tutors could do more in terms of involving students during their activities, thus motivating students to become more autonomous. In any case in both studies, (Blackman, Sweet & Byrne, 2015), it can be argued that this educational program is effective in keeping the perception of self-efficacy high. This confirmation is useful since the degree course is accredited as "*breastfeeding friendly*" as part of the Unicef Baby Friendly Initiative (WHO, 2009). Testing the achievement of the requirements for the accreditation has been useful as it shows that students have arrived at the third step in the "Breastfeeding Friendly degree course" (Table 1).

To be recognized, the "Breastfeeding Friendly degree course" is part of the international "Baby-Friendly Hospital Initiative" (BFHI), launched in 1991. It is a joint Unicef/World Health Organization initiative set up to ensure that all maternities, whether free standing or hospital based, become centers of breastfeeding support. A maternity facility can be designated "baby-friendly" when it has implemented 10 specific steps in the support of successful breastfeeding. The process is currently controlled by national breastfeeding authorities, using Global Criteria that can be applied to maternity care in every country. Implementation guides for the BFHI have been developed by Unicef and WHO. The approval of the questionnaire by Unicef Italy (Blackman, Sweet & Byrne, 2015) validated by this research, allows the identification of instrumentation able to measure the self-efficacy on the part of the operator, regardless of culture, country of origin or professional standing (doctor, midwife, nurse) (Dennis, 2003). Such instrumentation can also be utilised by those involved in on-going training (Ward & Byrne, 2011; Healer, 2015). Operators need to test their theoretical abilities, while at the same time confident in their practical abilities, including their self-efficacy perception (Freed, Clark, Harris & Lowdermilk, 1996; Cantrill, Creedy & Cooke, 2003).

## **5. Conclusions**

This research highlights the validity of the Australian questionnaire, both in the Italian context and in courses of Midwifery at the University of Milan. The University has decided to adopt this format with the view of going on with the testing of the perception of self-efficacy within the student body

in terms of their ability to assist breast feeding women during their training. Today Italian students have a lower perception of self-efficacy with regard to assistance and support to the mother, managing a baby crying out of hunger, seeking the support of family and friends in their decision to breastfeed and in suggesting strategies to the mother to meet the needs of the newborn. In some areas some students did demonstrate a lack of confidence. Mainly in helping to determine what effective feeding is, avoiding the administration of other foods or drinks, and in providing guidance on available support services for breastfeeding mothers. These outcomes are significant as they emphasize the importance of both theoretical and in the field training, with regard to aims outlined in steps 6, 10 of the WHO/Unicef standards for both the mother and baby friendly care.

### *5.1. Study Limitations*

This study has some limitations: first of all, the sample size can be considered small (76 cases). Besides this, students came only from the University of Milan's midwifery degree course. To enable generalisability, it is considered useful to recruit a wider sample from different programs. This can be helpful in the identification of midwives' insecurities and the breastfeeding supporting activities, which they find difficult to learn.

### **Conflict of Interest**

Conflicts of Interest: None.

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**Table 1.** Five steps to “*Breastfeeding Friendly degree course*”

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**Five steps to “Breastfeeding Friendly degree course”**

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1.	Adhere to the course standards of “Breastfeeding Friendly degree course” so that these may be inserted into degree course planning
2.	Prepare teachers in the development of standards and initiatives within their specific modules
3.	Train students in the necessary skills needed in maternal support
4.	Provide user friendly environments in order to improve breast feeding facilities
5.	Follow International Guidelines with regard to the selling of milk substitutes

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**Table 2.** The 37 original survey items in Blackman I., Sweet L. and Byrne study and the 34 items in this study

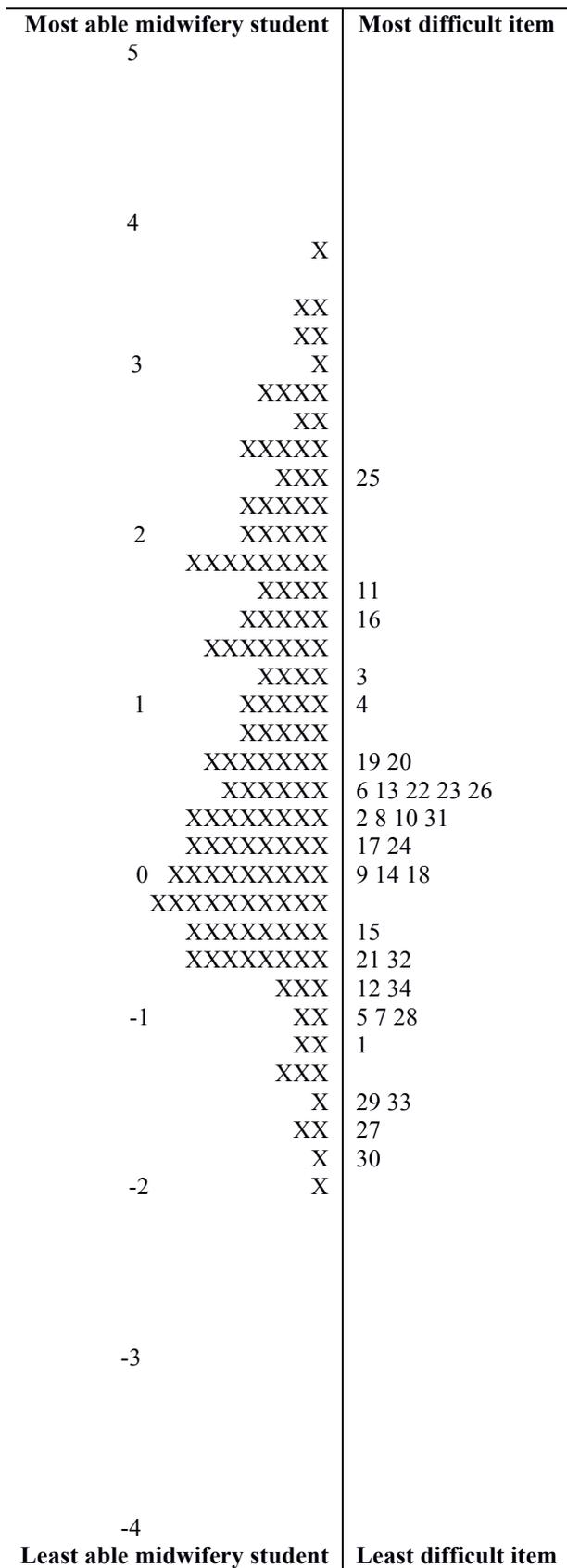
<b>Item number in original Blackman' survey</b>	<b>Item number in survey for this study</b>	<b>Midwives' perceived self-efficacy to instruct or supervise a mother to</b>
1	1	Hold her baby comfortably during breastfeeding
2	2	Position her baby correctly at her breast
3	3	Focus on getting through one feed at a time
4	4	Recognise the signs of good attachment
5	5	Take her baby off the breast without pain to the nipple
6	6	Determine if the baby is getting enough milk
7	7	Gain her family's support in her decision to breastfeed
8	8	Motivate her to breastfeed successfully
9	9	Breastfeed her baby without using formula as a supplement
10	10	Ensure that her baby is properly attached for the whole feed
11	11	Manage her crying baby who wants to breastfeed
12	12	Keep her baby awake during feeding
13	13	Maintain her milk supply by using demand feeding
14	14	Not to bottle-feed for the first 6 weeks
15	15	Feed her baby only breast milk
16	16	Keep mother motivated to breastfeed her baby
17	17	Get her friends to support her decision to breastfeed
18	18	Feed her baby every 2–3 h
19	Deleted	Comfortably breastfeed with her family members present
20	19	Comfortably breastfeed in public places
21	20	Finish feeding on one breast before changing to the other
22	21	Explain the rationale of demand feeding to the mother
23	22	Provide the mother with the rationale for feeding the baby overnight
24	Deleted	Encourage the mother to exclusively breastfeed her baby for at least 6 months
25	23	Identify if the mother is satisfied with her breastfeeding experience
26	24	Convey the fact that breastfeeding can be time-consuming
27	25	Provide mother with strategies to meet her baby's breastfeeding demands
28	26	Tell when her baby is finished breastfeeding
29	27	Explain to the mother the benefits of breastfeeding
30	28	Explain to the mother the rationale for avoiding the use of a dummy (pacifier)
31	29	Explain why it is important that mother and baby should be have skin to skin contact for at least 1 h immediately after birth
32	30	Provide the reasons to the mother why "rooming in" is important
33	31	Identify to the mother the support services that are available to her as a breastfeeding mother
34	32	Instruct the mother in the differing positions that she can use for breastfeeding her baby
35	33	Identify if the baby sucking properly at her breast
36	34	Give rationale for the first breastfeed within the first hour after birth
37	Deleted	Give rationale for not using a nipple shield

**Table 3.** General Estimates of reliability and Item-Total Correlation values for each item

<b>Item</b>	<b>General Estimates of reliability</b>	<b>Item-Total Correlation</b>
1	-1.092	0.53
2	0.362	0.45
3	1.205	0.32
4	1.055	0.53
5	-0.995	0.53
6	0.497	0.44
7	-0.836	0.65
8	0.321	0.70
9	0.005	0.67
10	0.294	0.63
11	1.680	0.31
12	-0.802	0.46
13	0.522	0.63
14	-0.083	0.72
15	-0.383	0.69
16	1.480	0.69
17	0.196	0.52
18	0.009	0.55
19	0.662	0.57
20	0.677	0.56
21	-0.543	0.75
22	0.509	0.69
23	0.480	0.34
24	0.074	0.53
25	2.443	0.61
26	0.423	0.60
27	-1.637	0.71
28	-0.931	0.63
29	-1.375	0.71
30	-1.746	0.66
31	0.324	0.52
32	-0.641	0.69
33	-1.427	0.79
34	-0.728 *	0.57

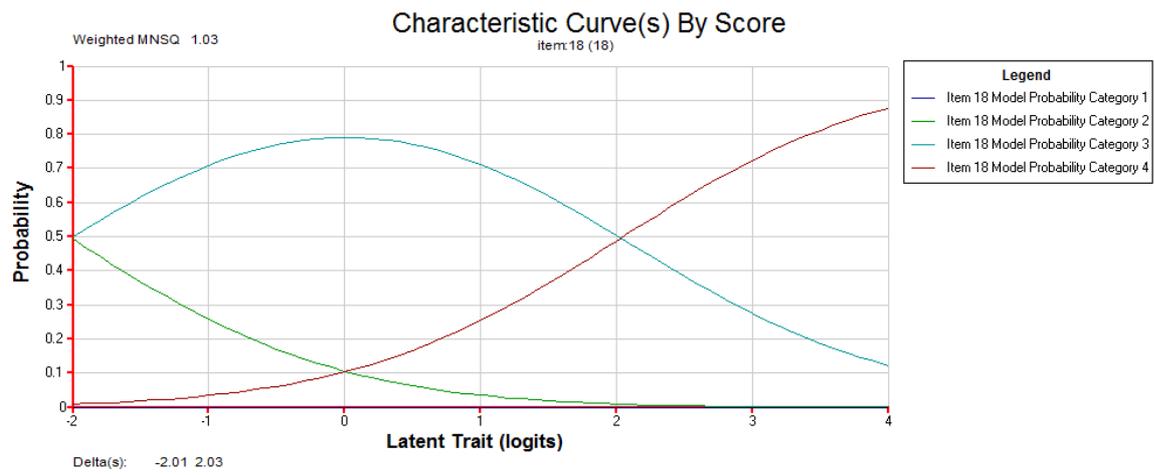
\*An asterisk next to a parameter estimate indicates that it is constrained  
Separation Reliability = 0.900

**Figure 1.** Map of perceived self-efficacy and item difficulty



Each 'X' represents 0.5 cases

**Figure 2.** Item Characteristic Curve (ICC) for item 18



**Figure 3.** Expected Score curves (ESC) for item 18

