Knowledge and Skills of the Lamaze Certified Childbirth Educator: Results of a Job Task Analysis

Wendy C. Budin, PhD, RN-BC, FAAN, LCCE, FACCE

Leon Gross, PhD

Judith A. Lothian, PhD, RN, LCCE, FACCE

Jeanne Mendelson, BA

ABSTRACT

Content validity of certification examinations is demonstrated over time with comprehensive job analyses conducted and analyzed by experts, with data gathered from stakeholders. In November 2011, the Lamaze International Certification Council conducted a job analysis update of the 2002 job analysis survey. This article presents the background, methodology, and findings of the job analysis. Changes in the test blueprint based on these findings are presented.

The Journal of Perinatal Education, 23(2), 65–78, <http://dx.doi.org/10.1891/1058-1243.23.2.65>

Keywords: childbirth educator certification, job analysis, childbirth educator competencies, test blueprint

The mission of Lamaze International is to promote, support, and protect natural, safe, and healthy birth through education and advocacy through the dedicated efforts of professional childbirth educators, providers, and parents.

One of the primary ways the organization pursues its mission is through its internationally recognized Lamaze Childbirth Educator Certification program. The Lamaze International Certification Exam is the only internationally recognized childbirth educator examination accredited by the National Commission for Certifying Agencies (NCCA), the accrediting body of the Institute for Credentialing Excellence (ICE). The NCCA standards require demonstration of a valid and reliable process for development,

implementation, maintenance, and governance of certification programs. NCCA uses a rigorous peer review process to establish accreditation standards, evaluate compliance with the standards, and recognize organizations/programs which demonstrate compliance.

The goal of Lamaze Childbirth Educator Certification is to provide a recognized credential that demonstrates to consumers and colleagues the specialized knowledge and skill required of a competent childbirth educator. The purpose of the Lamaze Childbirth Educator Certification Examination is to credential competent, highly qualified childbirth educators. Lamaze International awards the Lamaze Certified Childbirth Educator (LCCE) credential

The National Commission for Certifying Agencies, the accrediting body of the Institute for Credentialing Excellence, can be accessed at <http://www.credentialingexcellence.org>

The purpose of the Lamaze Childbirth Educator Certification Examination is to credential competent, highly qualified childbirth educators.

to those childbirth educators who successfully take and pass the certification exam. To date, over 12,500 professionals have been granted the LCCE educator credential.

The Lamaze Childbirth Educator Certification Examination evaluates the knowledge and skills (competencies) of an entry-level childbirth educator. The entry-level childbirth educator is able to

- Promote the childbearing experience as a normal, natural, and healthy process that profoundly affects women and their families (Competency 1).
- Assist women and their families to discover and use strategies that facilitate normal, natural, healthy pregnancy, birth, breastfeeding, and early parenting (Competency 2).
- Help women and their families to understand how interventions and complications influence the normal course of pregnancy, birth, breastfeeding, and early postpartum (Competency 3).
- Provide information and support that encourages attachment between babies and their families (Competency 4).
- Assist women and their families to make informed decisions for childbearing (Competency 5).
- Act as an advocate to promote, support, and protect natural, safe, and healthy birth (Competency 6).
- Design, teach, and evaluate a course in Lamaze preparation that increases a woman's confidence and ability to give birth (Competency 7).

Content validity of the examination is demonstrated over time with comprehensive job analyses conducted and analyzed by experts, with data gathered from stakeholders (certified childbirth educators). In November 2011, the Lamaze International Certification Council conducted a job analysis update of the 2002 job analysis survey. The job analysis was conducted, led by Project Director Judith A. Lothian, and Psychometric Consultant Leon Gross.

METHODOLOGY

The job analysis was prepared in the form of an electronic survey, using SurveyMonkey, a provider of software for online survey development, data collection, and analysis. The survey was disseminated

to the LCCE educator database of 2,014 individuals on October 25, 2011. Described in the following text are the meetings and related activities that were part of the development and refinement of the survey prior to its distribution, the analysis, and the impact the findings had on the test blueprint.

Panel of Subject Matter Experts and Task Group

Lamaze appointed a representative panel of 11 subject matter experts (SMEs) to develop the job analysis survey. One panel member, Judith A. Lothian, was appointed to serve as project director. Wendy C. Budin served as codirector. The SMEs held a one-day meeting in Ocean Grove, New Jersey, in April 2011. The primary purpose of the meeting was to develop the job analysis survey to correspond to the job content elements that are related to effective entry-level performance as a childbirth educator. Established reference materials from the profession as well as the existing test blueprint were used to identify 195 content items grouped into 9 content areas. The 9 content area groupings, two more than the number of domains comprising the existing blueprint, were intended to facilitate the respondent evaluations of the survey content.

Two rating scales, frequency and criticality, were developed to evaluate the content items. The ultimate goal was to rank content items from most relevant to least relevant with regard to on-the-job performance. Both rating scales had three reference points. Fifteen demographic items were included as well, to evaluate the representativeness of the respondent sample. There was no need for pilot testing of the

The full job analysis report with complete tables can be accessed at <http://www.lamaze.org/jobanalysis>

Subject Matter Experts

Wendy C. Budin, PhD, RN-BC, FAAN, LCCE, FACCE

Deborah Amis, BSN, LCCE, FACCE

Elena Carillo, LCCE, FACCE

Marilyn Curl, RN, MSN, CNM, LCCE, FACCE

Caroline Donahue, RN, MA, LCCE, FACCE

Barbara Hotelling, RN, MSN, LCCE, FACCE

Judith A. Lothian, PhD, RN, LCCE, FACCE

Kathryn McGrath, MSW, LCCE, FACCE

Allison Walsh, BS, LCCE, FACCE, IBCLC

TABLE 1
Frequency and Criticality Rating Scales

FIRST – Identify how **FREQUENTLY** you include each of the following topics in your childbirth classes.

THEN – Identify how **CRITICAL** you believe it is to include each topic in your childbirth classes.

Frequency	Criticality
1- Rarely	1- Not at all critical
2- Sometimes	2- Useful
3- Usually	3- Essential

survey because it was in the same format as the prior job analysis survey conducted in 2002. Only minor changes were deemed necessary.

Participants were directed to rate each of 195 content items related to frequency and criticality. Participants were asked to base their ratings on their professional experience. The rating scale definitions for frequency and criticality with their associated reference points are displayed in Table 1.

In deriving the rating scales, the panel of SMEs discussed the relationship between these metrics, the exam blueprint and content outline which would follow, and the relative emphasis of corresponding exam content. The more frequently that specific knowledge and skills are applied in childbirth education classes, and the more critical the specific knowledge and skills are to successful use by class attendees, the greater the emphasis these knowledge and skills should have on the exam. Greater emphasis is defined as a greater number of exam items.

The level of detail, symmetry, and number of rating categories of each rating scale were briefly reviewed. Since the job analysis was intended as an update of previously conducted studies, the same rating scales that were used successfully in prior studies were deemed desirable and appropriate to retain. The SMEs determined that both the frequency

TABLE 2
Survey Content Areas

A. Statement of Philosophy
B. Pregnancy Concepts
C. Labor and Birth
D. Medical Issues
E. Postpartum Concepts
F. Newborn Infant Concepts
G. Breastfeeding Concepts
H. Education Concepts
I. Professional Role Concepts

Participants were directed to rate each of 195 content items related to frequency and criticality. Participants were asked to base their ratings on their professional experience.

and criticality scales captured the range of potential responses with three categories as listed in Table 1.

The main portion of the survey consisted of 195 content items clustered within 9 broad content areas. Table 2 lists the 9 survey content areas labeled A to I. The survey also included 15 demographic items. One additional item asked for general comments about the survey, and lastly, recipients were incentivized to complete the survey by being included in a drawing for a \$100 Lamaze online store gift card. To be eligible, respondents were required to include contact information. This information was not shared with those analyzing the finding.

SURVEY RESULTS

The number of survey respondents overall was 573, representing a response rate of 28%. A survey response rate at this level is considered to be adequate.

Demographic Results

Nearly all LCCE educators are female; therefore, gender was deemed unnecessary to include as a demographic question. The typical respondent was a nurse and/or educator working as a childbirth educator on a part-time basis (7.37 hours per week). Her average class is 4.76 hours in length, with 5.05 classes comprising a childbirth series; the typical class is attended by 7.36 mothers. The majority (64.0%) of classes are taught in a hospital setting. A majority of the respondents (57.5%) indicated that Lamaze certification is required by their employer.

The typical respondent has been certified as an LCCE educator for over 16 years. This career length spans five recertification cycles and represents a significant professional and personal commitment to the childbirth educator profession and the mothers it serves. This average career length provides an excellent respondent perspective for the job analysis, particularly with how the profession may have evolved.

In this regard, three demographic questions were particularly sensitive to educator-related changes since the prior job analysis was conducted. Question 11 asked whether the new Lamaze Messaging and the updated Healthy Birth Practices had been incorporated within the respondents' class

The safe Healthy Birth Practices can be accessed at <http://www.lamazeinternational.org/HealthyBirthPractices>

curriculum (78.8% responded *yes*). Question 12 asked whether the respondents offered some form of online learning (69.8% responded *no*). Finally, question 15 asked whether the respondents utilized social media in their childbirth education practice and if so, in what ways (53.2% responded *no*).

These responses are not surprising, as they correspond to the degree of direct control that the respondents would have in adopting the changes. The curriculum updating dealing with the new Lamaze Messaging and updated Healthy Birth Practices (Question 11) can be done very readily with no assistance needed. In contrast, with a bit of training and/or self-teaching, social media can be adopted (Question 12), but offering online learning (Question 15) is likely to require outside technical assistance to be implemented.

Overall, based on the distribution of demographic characteristics, the respondent sample was considered to be representative of the childbirth educator profession.

Frequency and Criticality Results

As mentioned earlier, the actual subject matter content of the survey consisted of 195 specific task statements (knowledge elements) organized across 9 general content areas. Each task statement is a component of one of the seven competencies of an LCCE educator. The survey was organized using task statements according to general content areas rather than by competencies in order to improve flow and make it easier for respondents to rate the items. Respondents were asked to rate each of the 195 task statements on both the 3-point frequency and 3-point criticality scales shown earlier in the report; thus, the total number of response ratings was 390. Responses on both scales were scored as a “3” for the highest (i.e., most frequent or most critical) and “1” for the lowest (i.e., least frequent or least critical).

A table displaying the central component of the results—the means of the frequency and criticality ratings, combined frequency-plus-criticality mean, and disparity index for all 195 content items, in the order in which they were presented in the survey—is available on the Lamaze website at <http://www.lamaze.org/jobanalysis>. The combined means represented the overall importance of each task item, as determined by the respondent ratings.

The mean frequency and criticality ratings were identical at 2.56 (i.e., when rounded to the nearest hundredth). The significance of these overall mean

ratings is that respondents deemed the typical item to be midway between *sometimes* and *usually* in frequency, and midway between *useful* and *essential* for criticality. The close correspondence of frequency and criticality, which is typical of job analyses for certification tests, was further illustrated by a correlation of 0.97. Nonetheless, there were 64 items (nearly one-third of the items) for which the frequency and criticality ratings differed by more than 0.1; 27 of these items had a higher frequency mean and 37 of these items had a higher criticality mean.

The difference between frequency and criticality means was calculated as a disparity index. Given the close correspondence between frequency and criticality, the items in which criticality exceeds frequency may signal an increase in future importance. An example of this is item 195 (blogging/online engagement) which was discussed in the demographic section as already undergoing growth.

The mean frequency and criticality ratings are displayed in descending order in Tables 3 and 4. The tables included in this article only list the top 50 ratings. The full table can be accessed at <http://www.lamaze.org/jobanalysis>. The frequency means ranged from 1.40 to 2.99. Several items were at these low and high points, respectively. Criticality means range from 1.40 to 2.99. For both sets of ratings, the ranges (1.59) exceeded 75% of the maximum range possible, an indication that respondents appropriately avoided any halo or response set and indeed, reacted to the task items based on their professional experience.

The combined frequency and criticality ratings for the top 50 content items are displayed in descending order in Table 5. The combined means ranged from 2.93 (item 70—routine use of perineal shaves) to 5.96 (item 49—comfort measures). Many of the same items are included in the top 10 rated items for frequency, criticality, and combined mean score. These include comfort measures, signs of labor, emotional support, physical support, positioning, keeping mother and baby together skin to skin, role of support person, maternal movement, mother–infant bonding, and inherent ability of women to give birth.

Table 6 displays the ratings of the top 50 content items in descending order of the disparity index. This index ranged from +0.28 (item 6—contemporary practices of birth) to −0.37 (item 194—writing/publishing).

We noted earlier that the content items were organized differently in the survey than they are in the exam blueprint. The survey sequence was

TABLE 3
Means Sorted by Frequency (Items 1–50)

Item Label	Item Name	Frequency Mean	Criticality Mean	Combined Mean (F+C)	Disparity Index
C-49	Comfort measures	2.99	2.97	5.96	0.02
C-37	Signs of labor	2.99	2.96	5.95	0.03
C-63	Maternal movement	2.99	2.93	5.92	0.06
A-10	Role of support person	2.99	2.93	5.92	0.06
C-50	Physical support	2.99	2.94	5.93	0.05
C-62	Positioning	2.99	2.94	5.93	0.05
C-48	Emotional support	2.99	2.95	5.94	0.03
C-47	Phases of labor	2.98	2.89	5.88	0.09
C-83	Keeping mother and baby together skin to skin	2.98	2.94	5.92	0.04
A-1	Inherent ability of women to give birth	2.97	2.92	5.89	0.05
C-82	Mother–infant bonding	2.97	2.93	5.90	0.04
C-40	Role of pain	2.96	2.90	5.86	0.07
C-44	Character of contractions	2.96	2.90	5.86	0.07
C-43	Cervical changes	2.96	2.86	5.82	0.10
C-39	Importance of labor starting on its own	2.96	2.91	5.87	0.05
E-113	Emotional changes	2.95	2.87	5.82	0.08
C-65	Back labor	2.94	2.82	5.77	0.12
C-53	Massage	2.94	2.82	5.76	0.12
C-78	Evidence-based guidelines for pushing	2.94	2.87	5.81	0.07
C-46	Descent/rotation of baby	2.94	2.82	5.75	0.12
C-76	Risks of epidural anesthesia	2.94	2.84	5.78	0.09
E-112	Physical changes	2.93	2.81	5.74	0.12
A-3	Influences of birth environment	2.93	2.80	5.73	0.13
E-122	Support	2.93	2.88	5.81	0.04
E-123	Postpartum mood disorders	2.92	2.87	5.80	0.05
C-59	Heat/cold applications	2.92	2.74	5.66	0.18
C-81	Physiologic pushing	2.92	2.85	5.77	0.07
C-45	Fetal presentations	2.92	2.79	5.71	0.12
C-64	Nourishment	2.92	2.76	5.68	0.16
D-101	Cesarean birth	2.92	2.85	5.77	0.07
C-52	Touch relaxation	2.91	2.83	5.74	0.08
C-68	Risks of elective induction	2.91	2.86	5.77	0.05
C-77	Analgesia for labor	2.91	2.80	5.70	0.11
C-67	Evidence based guidelines for induction of labor	2.90	2.84	5.74	0.06
A-11	Role of healthcare provider	2.90	2.71	5.61	0.18
C-51	Breathing techniques	2.89	2.78	5.68	0.11
C-69	Augmentation of labor	2.88	2.80	5.68	0.08
A-20	Lamaze's Healthy Birth Practices	2.88	2.81	5.69	0.06
C-58	Therapeutic use of music	2.88	2.68	5.56	0.19
C-61	Hydrotherapy	2.87	2.73	5.61	0.14
D-110	Artificial rupture of membranes	2.87	2.78	5.64	0.09
A-2	Inner wisdom guides women during birth process	2.86	2.77	5.63	0.09
A-14	Relaxation as a life skill	2.86	2.77	5.63	0.09
A-19	Satisfaction with childbirth experience	2.86	2.80	5.66	0.06
H-151	Communicating	2.86	2.83	5.68	0.03
A-6	Contemporary practices of birth	2.85	2.57	5.42	0.28
C-56	Attention focusing	2.85	2.74	5.59	0.11
B-33	Discomforts/comfort measures during pregnancy	2.84	2.75	5.58	0.09

intended to facilitate responses. However, in order to calculate the impact of the content ratings for the exam blueprint, the content items had to be recategorized within their competency content clusters in the blueprint. Table 7 displays this reclassification in

the sequence of the seven competency areas. All 195 content items are included.

Table 8 presents a series of calculations to determine if any content emphases in the blueprint should be revised. Two factors were involved in

TABLE 4
Means Sorted by Criticality (Items 1–50)

Item Label	Item Name	Frequency Mean	Criticality Mean	Combined Mean (F+C)	Disparity Index
C-49	Comfort measures	2.99	2.97	5.96	0.02
C-37	Signs of labor	2.99	2.96	5.95	0.03
C-48	Emotional support	2.99	2.95	5.94	0.03
C-83	Keeping mother and baby together skin to skin	2.98	2.94	5.92	0.04
C-50	Physical support	2.99	2.94	5.93	0.05
C-62	Positioning	2.99	2.94	5.93	0.05
C-82	Mother–infant bonding	2.97	2.93	5.90	0.04
A-10	Role of support person	2.99	2.93	5.92	0.06
C-63	Maternal movement	2.99	2.93	5.92	0.06
A-1	Inherent ability of women to give birth	2.97	2.92	5.89	0.05
C-39	Importance of labor starting on its own	2.96	2.91	5.87	0.05
C-44	Character of contractions	2.96	2.90	5.86	0.07
C-40	Role of pain	2.96	2.90	5.86	0.07
C-47	Phases of labor	2.98	2.89	5.88	0.09
E-122	Support	2.93	2.88	5.81	0.04
E-123	Postpartum mood disorders	2.92	2.87	5.80	0.05
C-78	Evidence based guidelines for pushing	2.94	2.87	5.81	0.07
E-113	Emotional changes	2.95	2.87	5.82	0.08
C-68	Risks of elective induction	2.91	2.86	5.77	0.05
C-43	Cervical changes	2.96	2.86	5.82	0.10
D-101	Cesarean birth	2.92	2.85	5.77	0.07
C-81	Physiologic pushing	2.92	2.85	5.77	0.07
C-67	Evidence based guidelines for induction of labor	2.90	2.84	5.74	0.06
I-185	Confidentiality	2.79	2.84	5.64	–0.05
C-76	Risks of epidural anesthesia	2.94	2.84	5.78	0.09
F-131	Attachment	2.83	2.83	5.66	0.00
C-52	Touch relaxation	2.91	2.83	5.74	0.08
G-138	Benefits	2.83	2.83	5.66	0.00
H-151	Communicating	2.86	2.83	5.68	0.03
C-65	Back labor	2.94	2.82	5.77	0.12
C-53	Massage	2.94	2.82	5.76	0.12
C-46	Descent/rotation of baby	2.94	2.82	5.75	0.12
H-150	Informed consent	2.82	2.81	5.64	0.01
A-20	Lamaze’s Healthy Birth Practices	2.88	2.81	5.69	0.06
E-112	Physical changes	2.93	2.81	5.74	0.12
I-187	Patient’s rights	2.79	2.81	5.61	–0.02
H-172	Reading current literature in childbirth field	2.79	2.81	5.60	–0.02
G-139	Feeding cues	2.73	2.80	5.53	–0.07
A-19	Satisfaction with childbirth experience	2.86	2.80	5.66	0.06
A-3	Influences of birth environment	2.93	2.80	5.73	0.13
C-77	Analgesia for labor	2.91	2.80	5.70	0.11
C-69	Augmentation of labor	2.88	2.80	5.68	0.08
C-45	Fetal presentations	2.92	2.79	5.71	0.12
D-102	Risks of elective cesarean	2.81	2.79	5.61	0.02
G-140	Infant positioning and latch	2.63	2.79	5.41	–0.16
C-51	Breathing techniques	2.89	2.78	5.68	0.11
D-110	Artificial rupture of membranes	2.87	2.78	5.64	0.09
A-2	Inner wisdom guides women during birth process	2.86	2.77	5.63	0.09
C-84	Risks of artificial rupture of membranes	2.82	2.77	5.59	0.05
A-14	Relaxation as a life skill	2.86	2.77	5.63	0.09

TABLE 5
Means Sorted by Frequency Plus Criticality (Items 1–50)

Item Label	Item Name	Frequency Mean	Criticality Mean	Combined Mean (F+C)	Disparity Index
C-49	Comfort measures	2.99	2.97	5.96	0.02
C-37	Signs of labor	2.99	2.96	5.95	0.03
C-48	Emotional support	2.99	2.95	5.94	0.03
C-50	Physical support	2.99	2.94	5.93	0.05
C-62	Positioning	2.99	2.94	5.93	0.05
C-83	Keeping mother and baby together skin to skin	2.98	2.94	5.92	0.04
A-10	Role of support person	2.99	2.93	5.92	0.06
C-63	Maternal movement	2.99	2.93	5.92	0.06
C-82	Mother–infant bonding	2.97	2.93	5.90	0.04
A-1	Inherent ability of women to give birth	2.97	2.92	5.89	0.05
C-47	Phases of labor	2.98	2.89	5.88	0.09
C-39	Importance of labor starting on its own	2.96	2.91	5.87	0.05
C-40	Role of pain	2.96	2.90	5.86	0.07
C-44	Character of contractions	2.96	2.90	5.86	0.07
C-43	Cervical changes	2.96	2.86	5.82	0.10
E-113	Emotional changes	2.95	2.87	5.82	0.08
C-78	Evidence based guidelines for pushing	2.94	2.87	5.81	0.07
E-122	Support	2.93	2.88	5.81	0.04
E-123	Postpartum mood disorders	2.92	2.87	5.80	0.05
C-76	Risks of epidural anesthesia	2.94	2.84	5.78	0.09
C-68	Risks of elective induction	2.91	2.86	5.77	0.05
D-101	Cesarean birth	2.92	2.85	5.77	0.07
C-65	Back labor	2.94	2.82	5.77	0.12
C-81	Physiologic pushing	2.92	2.85	5.77	0.07
C-53	Massage	2.94	2.82	5.76	0.12
C-46	Descent/rotation of baby	2.94	2.82	5.75	0.12
C-67	Evidence based guidelines for induction of labor	2.90	2.84	5.74	0.06
E-112	Physical changes	2.93	2.81	5.74	0.12
C-52	Touch relaxation	2.91	2.83	5.74	0.08
A-3	Influences of birth environment	2.93	2.80	5.73	0.13
C-45	Fetal presentations	2.92	2.79	5.71	0.12
C-77	Analgesia for labor	2.91	2.80	5.70	0.11
A-20	Lamaze's Healthy Birth Practices	2.88	2.81	5.69	0.06
H-151	Communicating	2.86	2.83	5.68	0.03
C-64	Nourishment	2.92	2.76	5.68	0.16
C-51	Breathing techniques	2.89	2.78	5.68	0.11
C-69	Augmentation of labor	2.88	2.80	5.68	0.08
F-131	Attachment	2.83	2.83	5.66	0.00
G-138	Benefits	2.83	2.83	5.66	0.00
A-19	Satisfaction with childbirth experience	2.86	2.80	5.66	0.06
C-59	Heat/cold applications	2.92	2.74	5.66	0.18
D-110	Artificial rupture of membranes	2.87	2.78	5.64	0.09
I-185	Confidentiality	2.79	2.84	5.64	−0.05
H-150	Informed consent	2.82	2.81	5.64	0.01
A-2	Inner wisdom guides women during birth process	2.86	2.77	5.63	0.09
A-14	Relaxation as a life skill	2.86	2.77	5.63	0.09
D-102	Risks of elective cesarean	2.81	2.79	5.61	0.02
C-61	Hydrotherapy	2.87	2.73	5.61	0.14
A-11	Role of healthcare provider	2.90	2.71	5.61	0.18
I-187	Patient's rights	2.79	2.81	5.61	−0.02

TABLE 6
Means Sorted by Disparity Index (Items 1–50)

Item Label	Item Name	Frequency Mean	Criticality Mean	Combined Mean (F+C)	Disparity Index
A-6	Contemporary practices of birth	2.85	2.57	5.42	0.28
A-9	Role of doula	2.69	2.46	5.15	0.24
B-23	Physical changes of pregnancy	2.79	2.59	5.38	0.20
C-58	Therapeutic use of music	2.88	2.68	5.56	0.19
D-97	Vacuum extraction	2.76	2.57	5.34	0.19
C-59	Heat/cold applications	2.92	2.74	5.66	0.18
A-11	Role of healthcare provider	2.90	2.71	5.61	0.18
B-24	Emotional changes of pregnancy	2.78	2.61	5.40	0.17
C-64	Nourishment	2.92	2.76	5.68	0.16
C-60	Aromatherapy	2.62	2.47	5.09	0.15
C-57	Imagery	2.80	2.66	5.46	0.14
C-61	Hydrotherapy	2.87	2.73	5.61	0.14
D-100	Fetal distress	2.81	2.68	5.49	0.14
D-96	Forceps	2.61	2.48	5.09	0.13
A-7	Cultural aspects of birth	2.36	2.23	4.60	0.13
A-3	Influences of birth environment	2.93	2.80	5.73	0.13
C-45	Fetal presentations	2.92	2.79	5.71	0.12
C-46	Descent/rotation of baby	2.94	2.82	5.75	0.12
C-65	Back labor	2.94	2.82	5.77	0.12
C-53	Massage	2.94	2.82	5.76	0.12
E-112	Physical changes	2.93	2.81	5.74	0.12
B-25	Role changes	2.59	2.47	5.06	0.11
C-51	Breathing techniques	2.89	2.78	5.68	0.11
A-5	History of childbirth education	1.94	1.83	3.78	0.11
C-77	Analgesia for labor	2.91	2.80	5.70	0.11
C-56	Attention focusing	2.85	2.74	5.59	0.11
C-43	Cervical changes	2.96	2.86	5.82	0.10
F-125	Newborn physical characteristics	2.79	2.69	5.48	0.10
C-76	Risks of epidural anesthesia	2.94	2.84	5.78	0.09
B-33	Discomforts/comfort measures during pregnancy	2.84	2.75	5.58	0.09
A-14	Relaxation as a life skill	2.86	2.77	5.63	0.09
D-110	Artificial rupture of membranes	2.87	2.78	5.64	0.09
E-120	Rest/activity	2.83	2.74	5.57	0.09
C-47	Phases of labor	2.98	2.89	5.88	0.09
A-2	Inner wisdom guides women during birth process	2.86	2.77	5.63	0.09
C-69	Augmentation of labor	2.88	2.80	5.68	0.08
H-173	Use of Internet as a resource	2.73	2.65	5.38	0.08
C-79	Directed pushing	2.70	2.62	5.32	0.08
B-27	Exercise/body mechanics	2.67	2.59	5.25	0.08
C-52	Touch relaxation	2.91	2.83	5.74	0.08
D-89	Placenta previa/abruptio	2.40	2.32	4.73	0.08
D-104	Meconium staining	2.67	2.59	5.26	0.08
E-113	Emotional changes	2.95	2.87	5.82	0.08
E-115	Family adjustment	2.83	2.76	5.59	0.08
B-21	Fetal growth and development	2.37	2.30	4.67	0.08
C-38	Hormonal orchestration of labor	2.79	2.71	5.51	0.08
A-18	Health promotion/wellness	2.68	2.61	5.29	0.07
C-75	Risks of episiotomy	2.75	2.68	5.43	0.07
C-74	Evidence based guidelines for electronic fetal monitoring	2.79	2.72	5.51	0.07
D-111	Circumcision	2.50	2.43	4.93	0.07

TABLE 7

Content Items Linked to Competencies/ Combined Means (F+ C) (Items 1–50)

Task/Content Areas	Competency	Frequency Mean	Criticality Mean	Combined Mean (F+C)
A-1 Inherent ability of women to give birth	1	2.97	2.92	5.89
A-2 Inner wisdom guides women during birth process	1	2.86	2.77	5.63
A-3 Influences of birth environment	1	2.93	2.80	5.73
A-4 Meaning of birth	1	2.49	2.45	4.94
A-6 Contemporary practices of birth	1	2.85	2.57	5.42
A-7 Cultural aspects of birth	1	2.36	2.23	4.60
A-8 Cultural aspects of pain	1	2.40	2.34	4.74
A-11 Role of healthcare provider	1	2.90	2.71	5.61
A-17 Women-centered care	1	2.39	2.41	4.80
A-18 Health promotion/wellness	1	2.68	2.61	5.29
A-19 Satisfaction with childbirth experience	1	2.86	2.80	5.66
B-21 Fetal growth and development	1	2.37	2.30	4.67
B-22 Anatomy and physiology of conception	1	1.54	1.67	3.21
B-23 Physical changes of pregnancy	1	2.79	2.59	5.38
B-24 Emotional changes of pregnancy	1	2.78	2.61	5.40
B-25 Role changes	1	2.59	2.47	5.06
B-35 Sexuality	1	2.29	2.31	4.60
C-36 Safety of home birth	1	1.98	2.04	4.01
C-37 Signs of labor	1	2.99	2.96	5.95
C-38 Hormonal orchestration of labor	1	2.79	2.71	5.51
C-39 Importance of labor starting on its own	1	2.96	2.91	5.87
C-40 Role of pain	1	2.96	2.90	5.86
C-42 Reproductive anatomy	1	2.43	2.40	4.83
C-43 Cervical changes	1	2.96	2.86	5.82
C-44 Character of contractions	1	2.96	2.90	5.86
C-45 Fetal presentations	1	2.92	2.79	5.71
C-46 Descent/rotation of baby	1	2.94	2.82	5.75
C-47 Phases of labor	1	2.98	2.89	5.88
C-81 Physiologic pushing	1	2.92	2.85	5.77
C-82 Mother–infant bonding	1	2.97	2.93	5.90
E-112 Physical changes	1	2.93	2.81	5.74
E-113 Emotional changes	1	2.95	2.87	5.82
E-114 Role changes	1	2.79	2.72	5.51
E-115 Family adjustment	1	2.83	2.76	5.59
G-136 Anatomy and physiology	1	2.53	2.57	5.10
G-138 Benefits	1	2.83	2.83	5.66
A-9 Role of doula	2	2.69	2.46	5.15
A-10 Role of support person	2	2.99	2.93	5.92
A-14 Relaxation as a life skill	2	2.86	2.77	5.63
A-20 Lamaze's Healthy Birth Practices	2	2.88	2.81	5.69
B-26 Nutrition during pregnancy	2	2.47	2.47	4.93
B-27 Exercise/body mechanics	2	2.67	2.59	5.25
B-28 Over-the-counter drugs	2	2.07	2.17	4.24
B-29 Evidence-based guidelines for use of alcohol in pregnancy	2	2.17	2.34	4.51
B-30 Evidence-based guidelines for the use of caffeine	2	2.12	2.25	4.37
B-31 Evidence-based guidelines for the use of tobacco	2	2.18	2.36	4.54
B-32 Environmental hazards during pregnancy	2	1.98	2.21	4.19
B-33 Discomforts/comfort measures during pregnancy	2	2.84	2.75	5.58
C-41 Theories of pain	2	2.66	2.60	5.26
C-48 Emotional support	2	2.99	2.95	5.94
C-49 Comfort measures	2	2.99	2.97	5.96
C-50 Physical support	2	2.99	2.94	5.93
C-51 Breathing techniques	2	2.89	2.78	5.68
C-52 Touch relaxation	2	2.91	2.83	5.74

(continued)

TABLE 7
Content Items Linked to Competencies/ Combined Means (F+C) (Items 1–50) (Cont.)

Task/Content Areas	Competency	Frequency Mean	Criticality Mean	Combined Mean (F+C)
C-53 Massage	2	2.94	2.82	5.76
C-54 Therapeutic touch	2	2.55	2.57	5.11
C-55 Acupressure	2	2.30	2.30	4.61
C-56 Attention focusing	2	2.85	2.74	5.59
C-57 Imagery	2	2.80	2.66	5.46
C-58 Therapeutic use of music	2	2.88	2.68	5.56
C-59 Heat/cold applications	2	2.92	2.74	5.66
C-60 Aromatherapy	2	2.62	2.47	5.09
C-61 Hydrotherapy	2	2.87	2.73	5.61
C-62 Positioning	2	2.99	2.94	5.93
C-63 Maternal movement	2	2.99	2.93	5.92
C-64 Nourishment	2	2.92	2.76	5.68
C-65 Back labor	2	2.94	2.82	5.77
C-66 VBAC preparation	2	2.28	2.41	4.68
C-83 Keeping mother and baby together skin to skin	2	2.98	2.94	5.92
C-85 Stress response	2	2.74	2.72	5.46
E-116 Exercise	2	2.56	2.54	5.10
E-117 Nutrition	2	2.61	2.58	5.20
E-118 Sexuality	2	2.60	2.57	5.17
E-119 Family planning	2	2.43	2.49	4.92
E-120 Rest/activity	2	2.83	2.74	5.57
E-121 Time management	2	2.51	2.53	5.04
E-122 Support	2	2.93	2.88	5.81
E-124 Employment issues	2	2.01	2.11	4.12
G-137 Preparation	2	2.55	2.59	5.13
G-139 Feeding cues	2	2.73	2.80	5.53
G-140 Infant positioning and latch	2	2.63	2.79	5.41
G-141 Determining adequate intake	2	2.63	2.76	5.39
G-142 Milk supply	2	2.64	2.75	5.39
G-143 Storage/pumping	2	2.37	2.55	4.92
G-144 Family support	2	2.70	2.74	5.45
G-145 Engorgement	2	2.56	2.64	5.20
G-146 Sore nipples	2	2.61	2.67	5.28
G-147 Returning to work	2	2.42	2.50	4.92
A-13 Loss and the process of grieving	3	1.83	2.07	3.91
B-34 Prenatal testing	3	2.01	2.14	4.15
C-67 Evidence-based guidelines for induction of labor	3	2.90	2.84	5.74
C-68 Risks of elective induction	3	2.91	2.86	5.77
C-69 Augmentation of labor	3	2.88	2.80	5.68
C-70 Routine use of perineal shaves	3	1.40	1.53	2.93
C-71 Use of enemas	3	1.48	1.58	3.06
C-72 Evidence-based guidelines for vaginal exams	3	2.45	2.50	4.95
C-73 Evidence-based guidelines for use of intravenous fluids	3	2.67	2.61	5.28
C-74 Evidence-based guidelines for electronic fetal monitoring	3	2.79	2.72	5.51
C-75 Risks of episiotomy	3	2.75	2.68	5.43
C-76 Risks of epidural anesthesia	3	2.94	2.84	5.78
C-77 Analgesia for labor	3	2.91	2.80	5.70
C-78 Evidence-based guidelines for pushing	3	2.94	2.87	5.81
C-79 Directed pushing	3	2.70	2.62	5.32
C-80 Risks of directed pushing	3	2.79	2.73	5.52
C-84 Risks of artificial rupture of membranes	3	2.82	2.77	5.59
D-86 Hyperemesis	3	1.57	1.64	3.22
D-87 Multiple gestation	3	1.73	1.83	3.56
D-88 Cardiac problems	3	1.40	1.54	2.94

(continued)

TABLE 7
Content Items Linked to Competencies/ Combined Means (F+C) (Items 1–50) (Cont.)

Task/Content Areas	Competency	Frequency Mean	Criticality Mean	Combined Mean (F+C)
D-89 Placenta previa/abruption	3	2.40	2.32	4.73
D-90 HIV/AIDS	3	1.44	1.63	3.07
D-91 Intrauterine death	3	1.53	1.78	3.32
D-92 Bereavement issues	3	1.68	1.94	3.62
D-93 Preterm labor	3	2.80	2.76	5.56
D-94 Postterm labor	3	2.71	2.64	5.36
D-95 Infections	3	2.35	2.41	4.76
D-96 Forceps	3	2.61	2.48	5.09
D-97 Vacuum extraction	3	2.76	2.57	5.34
D-98 Prolapsed cord	3	2.59	2.53	5.12
D-99 CPD	3	2.59	2.52	5.11
D-100 Fetal distress	3	2.81	2.68	5.49
D-101 Cesarean birth	3	2.92	2.85	5.77
D-102 Risks of elective cesarean	3	2.81	2.79	5.61
D-103 Dystocia	3	2.57	2.55	5.12
D-104 Meconium staining	3	2.67	2.59	5.26
D-105 Postpartum hemorrhage	3	2.40	2.42	4.82
D-106 Hyperbilirubinemia	3	2.20	2.27	4.48
D-107 Hypoglycemia	3	2.01	2.13	4.14
D-108 Diabetes	3	1.98	2.13	4.11
D-109 Hypertensive disorders	3	2.18	2.27	4.45
D-110 Artificial rupture of membranes	3	2.87	2.78	5.64
D-111 Circumcision	3	2.50	2.43	4.93
E-123 Postpartum mood disorders	3	2.92	2.87	5.80
A-15 Parenting styles	4	2.27	2.21	4.47
A-16 Cultural influences on parenting	4	2.10	2.09	4.19
F-125 Newborn physical characteristics	4	2.79	2.69	5.48
F-126 Infant capabilities	4	2.69	2.66	5.35
F-127 Infant sleep wake states	4	2.66	2.66	5.32
F-128 Emotional needs	4	2.78	2.76	5.55
F-129 Physical needs	4	2.78	2.76	5.54
F-130 Physical care	4	2.67	2.66	5.33
F-131 Attachment	4	2.83	2.83	5.66
F-132 Infant development	4	2.36	2.45	4.81
F-133 Safety issues	4	2.53	2.65	5.19
F-134 Evidence-based guidelines for co-sleeping	4	2.49	2.58	5.07
F-135 Choosing a healthcare provider	5	2.44	2.47	4.91
H-148 Decision making	5	2.76	2.74	5.49
H-149 Values clarification	5	2.49	2.52	5.01
H-150 Informed consent	5	2.82	2.81	5.64
H-151 Communicating	5	2.86	2.83	5.68
H-152 Negotiating	5	2.64	2.61	5.24
H-182 CIMS Mother Friendly Guidelines	5	2.40	2.51	4.91
H-183 Baby Friendly Hospital Initiative	5	2.54	2.58	5.12
H-153 Collaborating	6	2.61	2.58	5.19
H-154 Networking with colleagues	6	2.12	2.26	4.38
H-155 Networking with healthcare providers	6	2.20	2.31	4.51
H-156 Advocate for clients	6	2.47	2.56	5.04
I-185 Confidentiality	6	2.79	2.84	5.64
I-186 Conflict of interest	6	2.09	2.44	4.53
I-187 Patient's rights	6	2.79	2.81	5.61
I-188 Ethical issues of endorsement	6	2.23	2.49	4.73
I-189 Involvement in professional organizations	6	2.51	2.54	5.05
I-192 Involvement in community education	6	2.32	2.44	4.76

(continued)

TABLE 7
Content Items Linked to Competencies/ Combined Means (F + C) (Items 1–50) (Cont.)

Task/Content Areas	Competency	Frequency Mean	Criticality Mean	Combined Mean (F+C)
I-193 Public speaking	6	2.07	2.22	4.29
I-194 Writing/publishing	6	1.56	1.93	3.49
A-5 History of childbirth education	7	1.94	1.83	3.78
A-12 Referrals to healthcare providers	7	1.88	1.98	3.85
H-157 Design course of instruction	7	2.42	2.48	4.90
H-158 Implement course of instruction	7	2.46	2.51	4.97
H-159 Create learning environment	7	2.68	2.67	5.35
H-160 Culture of learner	7	2.47	2.53	5.00
H-161 Learning styles	7	2.58	2.61	5.19
H-162 Group dynamics	7	2.61	2.61	5.22
H-163 Principles of adult education	7	2.56	2.60	5.16
H-164 Theories of learning	7	2.36	2.43	4.79
H-165 Teaching strategies	7	2.58	2.60	5.18
H-166 Conducting needs assessment	7	2.46	2.51	4.97
H-167 Development of goals/objectives	7	2.52	2.58	5.11
H-168 Selection of content	7	2.66	2.64	5.30
H-169 Sequence of content	7	2.64	2.61	5.25
H-170 Teaching aids	7	2.81	2.76	5.57
H-171 Evaluation of learning	7	2.75	2.73	5.48
H-172 Reading current literature in childbirth field	7	2.79	2.81	5.60
H-173 Use of Internet as a resource	7	2.73	2.65	5.38
H-174 Evaluating research evidence in childbirth field	7	2.65	2.67	5.31
H-175 Incorporate research into practice	7	2.67	2.71	5.38
H-176 Cochrane guidelines for pregnancy and childbirth	7	2.51	2.55	5.06
H-177 WHO care practice guidelines for normal childbirth	7	2.51	2.56	5.07
H-178 WHO guidelines for the marketing of infant formula	7	2.35	2.46	4.81
H-179 AAP guidelines for infants	7	2.46	2.47	4.93
H-180 ACOG guidelines for pregnancy and birth	7	2.52	2.52	5.04
H-181 Lamaze International guidelines for childbirth education	7	2.80	2.76	5.56
H-184 Social media	7	2.03	2.16	4.19
I-190 Lamaze Code of Ethics	7	2.55	2.68	5.23
I-191 Marketing of childbirth practice	7	2.09	2.31	4.39
I-195 Blogging/online engagement	7	1.52	1.85	3.37

TABLE 8
Calculation of New Exam Blueprint Competency Emphases

Competency	Number of Content Items	Combined Mean (F + C) Within Competency	Rounded Percentage Weight From Job Analysis	Current Percentage Weight
1 - Childbirth as normal, natural, and healthy	36	5.35	19	16
2 - Assisting women and families	52	5.31	28	30
3 - Complications and interventions	44	4.83	21	16
4 - Information and support for attachment	12	5.16	6	5
5 - Informed decision making	8	5.25	4	5
6 - Advocacy	12	4.77	6	5
7 - Teaching	31	4.98	15	23

making this determination for each competency: the number of content items and the combined mean (i.e., frequency plus criticality). The combined mean treated frequency and criticality as weighted equally.

The logic of using these two factors was that competency areas with more items should have greater emphasis (i.e., more exam items) than competency areas with fewer items. Similarly, competency areas with a higher combined mean should have greater emphasis (i.e., more exam items) than competency areas with lower combined means. Each of the seven competency areas is listed with the corresponding number of survey content items and the combined mean. To compute a percentage emphasis for a competency area, the number of items is multiplied by the combined mean. The product is then divided by the overall combined survey mean. The results of these calculations are in the column listing the rounded percentage weights from the job analysis. These percentages range from 4% in Competency 5 to 28% in Competency 2. Although Competency 1 attained the highest combined mean, it had 16 fewer content items than Competency 2 and 8 fewer items than Competency 3. Therefore, Competency 1 was computed to have a lower percentage weight (19%) from the job analysis data than Competencies 2 and 3 (28% and 21%, respectively).

For comparison purposes, Table 8 also displays the competency percentage weights in the current blueprint. This comparison indicates a fairly close correspondence between the current blueprint percentages and the survey-based percentages. Competencies 4–6 have similar low percentages, and Competency 2 retains the highest percentage. However, there are shifts in emphasis to be addressed. In particular, Competency 3 (interventions and complications) displays a substantial percentage increase, and Competency 7 (teaching strategies) displays a substantial percentage decrease.

The job analysis project directors held a conference call in March 2013 to evaluate these data to determine if the percentage shifts were valid. If deemed valid, it would be compelling to modify the exam blueprint accordingly. A key point in conducting this review was that Competency 3 does indeed appear to have become more important. In contrast, while Competency 7 remains important, the shift in percentages appears to indicate that in the profession of childbirth education, *what is being taught* is becoming increasingly more important than *how it is being taught*.

Competency 3 (interventions and complications) displays a substantial percentage increase, and Competency 7 (teaching strategies) displays a substantial percentage decrease.

In this context, the project directors and consultants felt that the job analysis data were valid and would be a valid basis for updating the exam blueprint. The directors and consultants then determined that they would recommend to the certification council at their April meeting that the job analysis percentages in Table 8 be adopted and that the percentage changes be announced during the time interval between the administration of the April 2013 exam and the reporting of scores during May. This timing avoided confusion among April candidates regarding the current version of the blueprint and would allow time to notify failing candidates who would need to retake the exam of the changes prior to when they begin to prepare.

SUMMARY

The Lamaze job analysis survey presented 195 knowledge elements (survey items) organized in 9 content domains that respondents were asked to evaluate on 3-point frequency and criticality scales. The study was conducted in the form of an electronic survey distributed by the Lamaze International Certification Council to all LCCE educators. Oversight of the study was the responsibility of an 11-person task group consisting of a Lamaze SME as project director and 10 SMEs.

The survey was conducted electronically during a period from October 25, 2011 to December 1, 2011. The LCCE educators were contacted electronically by their e-mail addresses with a link to the electronic survey. The results were reviewed linking to the test blueprint and seven competencies. The job analysis supported the continued relevance of the competencies but suggested that the percentages of test items in each competency in the test blueprint be modified, as calculated from the data. The certification council acted on the suggested modifications during its annual meeting in May 2013 and announced the changes in the test blueprint later that month. The next job analysis is planned for 2018.

WENDY C. BUDIN is the editor-in-chief of *The Journal of Perinatal Education*. She is also the director of nursing research at NYU Langone Medical Center and adjunct professor at New York University College of Nursing. She is a

fellow in the American College of Childbirth Educators and is a member of the Lamaze International Certification Council. LEON GROSS is a psychometric consultant. Dr. Gross has provided psychometric support for the development and evaluation of the Lamaze Childbirth Educator Certification Examination for almost 20 years. JUDITH A. LOTHIAN is a childbirth educator in Brooklyn, New York; chairperson of the

Lamaze International Certification Council; and the associate editor of The Journal of Perinatal Education. She is also an associate professor in the College of Nursing at Seton Hall University in South Orange, New Jersey. JEANNE MENDELSON is an association executive with Lamaze International. As the chief operating officer for Lamaze, she oversees the certification program and manages accreditation.