
CHILD CARE EARLY EDUCATION
HEART MONITOR

The Child Care & Early Education Heart Monitor (CCEEHM)

An Integrated System for Monitoring the True Quality of Early Childhood Programs

---

1. The Challenge: A Divided View of Program Quality

Accurately measuring quality is a strategic imperative in the Child Care and Early Education (CCEE) field, as it directly informs policy, funding, and professional development. For decades, the sector has relied on a bifurcated approach to this crucial task. **Structural quality**—which includes foundational health and safety regulations, staff-child ratios, and group sizes—has been measured with one set of tools. Simultaneously, **process quality**—the vital, dynamic interactions between educators and children that form the very heart of learning—has been assessed using entirely separate and distinct instruments.

This siloed methodology creates a fragmented and incomplete understanding of a program's true environment and overall effectiveness. By treating these two fundamental aspects of quality as disconnected variables, program administrators, licensors, and quality assessors are left without a unified framework to see the full picture. This gap between structure and process prevents a true understanding of program impact, creating an urgent need for a single, integrated lens.

---

2. The Solution: A Unified Approach with the CCEEHM

The Child Care & Early Education Heart Monitor (CCEEHM) is an innovative software application designed to resolve this long-standing division. It provides a single, integrated platform to assess both structural and process quality, offering a holistic and actionable view of program performance.

eBook
www.bookemon.com
rfiene@rikinstitute.com

The CCEEHM is built upon the proven **Key Indicator Methodology (KIM)** and the theory of regulatory compliance. The CCEEHM achieves this by unifying the metrics that matter most, integrating key indicators from traditionally separate systems—licensing, QRIS, accreditation, and professional development—into one powerful, coherent framework. The system's power lies in its two complementary pillars of quality assessment.

---

3. How It Works: The Two Pillars of CCEE Quality Assessment

The CCEEHM's strength is derived from its unique integration of two distinct but complementary quality metrics, which together provide a comprehensive view of both the foundation and the heart of an early childhood program.

3.1. Pillar 1: Measuring Structural Quality with the Contact Hour (CH) Metric

The **Contact Hour (CH) metric** offers a more effective and efficient method for measuring compliance with critical structural standards like adult-child ratios and group sizes. Rather than relying on static, point-in-time checks, this metric provides a dynamic and accurate picture by simply asking six key questions about the arrival and departure times of staff and children. This data is used to generate a dynamic 'trapezoidal model' of adult-child contact hours throughout the entire day, moving far beyond a single, static snapshot. The result is a robust and nuanced understanding of a program's structural integrity and its true capacity to keep children healthy and safe.

3.2. Pillar 2: Assessing Process Quality with Program Quality Indicators (PQI)

The **Program Quality Indicators (PQI)** component is designed to measure the "heart" of quality—the crucial day-to-day interactions and learning experiences where "the magic occurs" between adults and children. This is accomplished through 10 validated indicators that evaluate the essential domains of process quality, including:

- **Educator qualifications** and professional staffing levels.
- The creation of a **stimulating and dynamic learning environment**, assessed by the presence of authentic materials, child-led projects, and a variety of accessible books and writing materials.
- Implementation of a **developmentally appropriate, individualized curriculum** informed by child assessments.

eBook
www.bookemon.com
rfiene@rikinstitute.com

- Meaningful opportunities for **family engagement** and robust two-way communication.
- Direct observation of **educator-child interactions**, capturing crucial behaviors like engaging in back-and-forth conversations, using materials such as puppets to encourage communication, and posing questions that develop a child's reasoning and problem-solving skills.

Together, these indicators capture the essence of a high-quality program where children are supported to learn and thrive.

---

4. Core Benefits for CCEE Professionals

For professionals tasked with upholding standards and driving improvement, the CCEEHM is more than a tool—it is a strategic asset that transforms monitoring from a compliance exercise into a catalyst for quality enhancement.

- **Unified Quality Picture** The system integrates structural compliance (Contact Hour) and process quality (PQI) into one holistic score. This ends the field's long-standing reliance on separate, disconnected tools and provides a single, comprehensive view of program effectiveness.
- **Efficient & Cost-Effective** Built on the proven Key Indicator Methodology, the CCEEHM provides a streamlined, resource-conscious, and scientifically grounded approach to monitoring, making comprehensive assessment more accessible.
- **Simplified & Automated** The CCEEHM is an easy-to-use software application. Assessors simply input observational and program data, and all complex scoring is calculated automatically by the app, ensuring consistency and saving valuable time.
- **Advanced AI-Powered Observation** The system is designed to leverage Artificial Intelligence with video cameras for continuous data collection. This technology is capable of conducting **thousands of observations** to fill the Contact Hour model, providing an incredibly rich dataset while significantly reducing human observer bias and 'drift' over time.
- **Actionable Insights** The comprehensive data generated by the CCEEHM directly supports a wide range of CCEE initiatives, including licensing decisions, Quality Rating and Improvement Systems (QRIS) ratings, accreditation, and targeted professional development and technical assistance.

eBook
www.bookemon.com
rfiene@rikinstitute.com

This powerful tool was developed by one of the foremost experts in the field of regulatory science.

---

5. Developed by a Leading Expert in Regulatory Science

The CCEEHM was developed by **Dr. Richard Fiene**, a research psychologist who has dedicated his career to improving the quality of child care nationally and internationally. As an affiliated Research Psychologist with the renowned **Penn State Edna Bennett Pierce Prevention Research Center**, Dr. Fiene is regarded as a leading international researcher in human services licensing, regulatory science, and early childhood quality improvement. His extensive research in differential monitoring, key indicators, and risk assessment has reshaped how regulatory bodies approach their work, establishing the deep credibility and scientific rigor behind the CCEEHM.

---

6. Access the Future of Quality Monitoring

The Child Care and Early Education Heart Monitor is available as a software application. Step into the next generation of quality assessment and gain a unified, efficient, and powerful view of what truly matters in early childhood programs.

CE2HM InfoGraphic Example:

https://g.co/gemini/share/cd1f1bb14ad2

eBook
www.bookemon.com

rfiene@rikinstitute.com

The Child Care and Early Education Heart Monitor: The Intersection of Structural Quality and Process Quality Using the Contact Hour Metric As The Foundation

Richard Fiene PhD 0000-0001-6095-5085

Research Institute for Key Indicators Data Laboratory

Penn State Edna Bennett Pierce Prevention Research Center

July 2025

Abstract

The Child Care and Early Education (CCEE) Heart Monitor (CCEEHM) is introduced as a new Integrated Program Monitoring System's Approach to assessing both structural and process quality in one platform. It builds upon the Contact Hour (CH) metric and the Key Indicator Methodology (KIM) that have been introduced in the CCEE licensing and monitoring field. The CCEEHM expands the use of the CH and KIM methods by integrating key elements from both structural and process quality into a software application that can be used by staff, licensors, and quality assessors. The CCEEHM draws indicators from licensing, regulatory compliance, quality rating and improvement systems, and other quality initiatives, such as accreditation, and professional development and technical assistance systems.

The Child Care and Early Education (CCEE) field needs a means to monitor the key elements of structural and process quality in a unified means. The theory of regulatory compliance has been suggested as a unifying framework for structural and process quality (Fiene, 2019; 2021; 2025a,b); but at a more practical level what could be used to essentially unify the monitoring and measurement of both structural and process quality. Generally, structural and process quality are measured separately from each other by using very separate and distinct tools

eBook www.bookemon.com

rfiene@rikinstitute.com

utilized by licensing inspectors and quality observers (Kontos & Fiene, 1987). This research paper will build off several concepts that deal with the creation of a new Contact Hour (CH) metric replacing measuring compliance with adult-child ratios while unifying structural quality with process quality. With this new unification of structural and process quality, it will help to build a more Integrated Monitoring Systems Approach (Freer & Fiene, 2023) which should go a long way in complementing the measurement strategies employed in licensing and quality rating and improvement systems that have proliferated in the child care and early education field.

Let's begin by placing some context on the title of this new Child Care and Early Education Heart Monitor. What do we mean by heart monitor? Within the research literature in determining the levels of quality generally these levels are broken into two distinctive categories, those that deal with structural quality, such as staff child ratios, group size, etc. Essentially health and safety or licensing rules and regulations. The interactions amongst the staff and children generally fall under the process quality side of the equation. But this is really the "heart" of quality. This is where the magic occurs, the so-called "dance" between the adult and the child(ren). All the structural quality rules and regulations are important in protecting children and keeping them healthy but the interaction of child and adult is where the action occurs. So what is being proposed is to combine these two categories of quality together into one system, placing the measurement and the monitoring of process quality squarely within the structural measurement strategy, the Contact Hour (CH) metric. This will be developed within this paper by fully describing the Contact Hour metric and a newly created CCEE Quality Indicator tool that will measure the quality enhancements within the Contact Hour metric and do this within an

eBook
www.bookemon.com

rfiene@rikinstitute.com

App (software application) that can be downloaded and it will produce the scores based upon reviewing specific documents and observations within a child care and early education program. This new Child Care and Early Education Heart Monitor (CCEEHM) should be both cost effective and efficient being based upon the key indicator methodology (Fiene & Nixon, 1985) and having it developed into an App (software application) should make it particularly easy to use for licensors, assessors, or observers since all the scoring would be done by the CCEEHM App.

Let's continue by delving into the Contact Hour (CH) metric (Fiene & Stevens, 2021). The Contact Hour metric has been proposed as a more effective and efficient metric for measuring compliance with adult-child ratios and group sizes in CCEE programs. It is simple to apply by just asking 6 questions about when children arrive and leave a CCEE program and how many staff are present in a particular classroom (See the second section for the questions and algorithms). Once that is done a trapezoidal model is built in which compliance with staff child and group size rules can be determined. Regulatory compliance is determined by comparing the resultant area to an ideal level of contact between staff and children. This introductory section is followed by the tool that would be used for determining the Contact Hour metric (Section 2) as well as the Program Quality Indicators (PQI)(Section 3) that need to be measured. Also, there is a screen shot of the opening page of the CCEEHM App that has been designed to measure compliance with the tools for CH and PQI at the end of Section 3.

In determining the results, the Contact Hours (CH) are dealt with as absolute values but let's enhance this result by moving it from an absolute value to one that is more relative by introducing process quality measures such as the Program Quality Indicators (PQI). The PQI portion of the tool has a good deal of observations that need to be made in classrooms. To do

eBook
www.bookemon.com

rfiene@rikinstitute.com

this, it would take 1000's of observations to fill the Contact Hour trapezoidal model which is not realistic. But let's let Artificial Intelligence (AI) do the observing and training of AI in what constitutes the various quality levels on the respective CH/PQI tool. By using AI and having video cameras in each of the classrooms to be assessed, this becomes doable. The CH/PQI observer would be able to collect the data by observing and assessing what it sees via the video cameras installed in the classrooms. Summary measurements would be made on an hourly basis and recorded as part of the Contact Hour trapezoidal model. At the end of the day, there would be a relative value utilized in this model rather than the absolute value that has been used in the past to determine structural quality compliance with adult-child ratio and group size. For example, if a CCEE program classroom exceeded the area of the trapezoidal model it would be out of compliance and if it were within the area of the trapezoidal model it was in compliance (see Section 2). By adding the PQI data, it changes this metric totally by adding process quality measures which can be measured on a 1-4 ordinal scale, similar to accreditation systems or an ordinal (1-7) scale, similar to many program quality tools, such as the Environmental Rating Scales (see Section 3).

This approach will get at the ***Heart of CCEE monitoring, "process quality"***, measuring the interactions amongst staff and children in an ongoing fashion. It moves the needle from being structural to process quality providing an intersection of both components of quality. The AI approach will also help to address the issues related to bias in regulatory compliance observing and decision making by inspectors/observers. By training the AI PQI Observers there should be greater certainty established in making the right decisions related to specific quality elements

eBook
www.bookemon.com

rfiene@rikinstitute.com

(Fiene, 2025c). Just as in establishing inter-rater reliability with human observers, the same can be done with the PQI AI Observers but there will be less drift with AI.

The next section describes the Contact Hour Metric methodology in detail. Section 3 provides the Program Quality Indicators (PQI) that are part of the CCEEHM App. These two sections are the meat of the new Integrated Program Monitoring Systems Approach. In fact a human observer could use these two sections and then manually use the CCEEHM App for doing their data entry. The App would then do all the scoring for the individual assessor (See Section 3).

eBook
www.bookemon.com

rfiene@rikinstitute.com

Section 2: Contact Hour (CH) Metric

One starts the Contact Hour (CH) metric methodology by asking the following six questions (The six questions should be asked of each grouping that is defined by a classroom or a well-defined group within each classroom tied to a specific adult-child ratio.):

1.When does your first teaching staff arrive or when does your facility open (TO1)?
2.When does your last teaching staff leave or when does your facility close (TO2)?
3.Number of teaching/caregiving staff (TA)?
4.Number of children on your maximum enrollment day (NC)?
5.When does your last child arrive (TH1)?
6.When does your first child leave (TH2)?

After getting the answers to these questions, the following formulae can be used to determine contact hours (CH) based upon the relationship between when the children arrive and leave (TH) and how long the facility is open (TO):

$$CH = ((NC\ (TO + TH)) / 2) / TA;$$

$$CH = (NC \times TO) / TA;$$

$$CH = ((NC \times TO) / 2) / TA;$$

$$CH = (NC^2) / TA$$

Where: CH = Contact Hours; NC = Number of Children; TO = Total number of hours the facility is open (TO2 - TO1); TA = Total number of teaching staff, and TH = Total number of hours at full enrollment (TH2 - TH1).

By knowing the number of contact hours (CH) it will be possible to rank order the exposure time of adults with children. Theoretically, this metric could then be used to determine that the greater contact hours is correlated with the increased non-regulatory compliance with adult-child ratios as determined in the below table (Table 1).

eBook
www.bookemon.com

rfiene@rikinstitute.com

Table 1: Contact Hour (CH) Conversion Table (RS Model(1.0)) (Fiene, 2020©)

Taking into Account Exposure Time and Density

Group Size, Staff Child Ratio, Number of Children and Staff

<---------- Adult-Child Ratios (Relatively Weighted Contact Hours)---------->

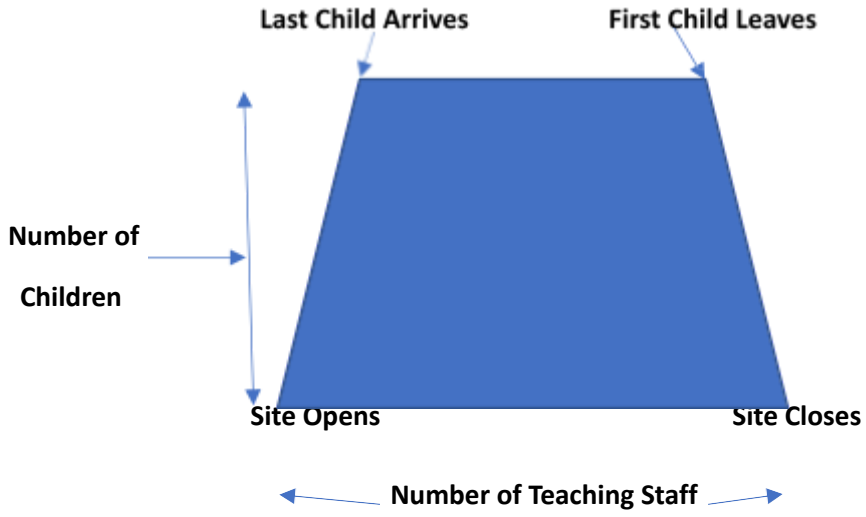
NC	CH	1:1	2:1	3:1	4:1	5:1	6:1	7:1	8:1	9:1	10:1	11:1	12:1	13:1	14:1	15:1
1	8	**8**	8	8	8	8	8	8	8	8	8	8	8	8	8	8
2	16	**8**	**16**	16	16	16	16	16	16	16	16	16	16	16	16	16
3	24	**8**	12	**24**	24	24	24	24	24	24	24	24	24	24	24	24
4	32	**8**	**16**	16	**32**	32	32	32	32	32	32	32	32	32	32	32
5	40	**8**	13	20	20	**40**	40	40	40	40	40	40	40	40	40	40
6	48	**8**	**16**	**24**	24	24	**48**	48	48	48	48	48	48	48	48	48
7	56	**8**	14	19	28	28	28	**56**	56	56	56	56	56	56	56	56
8	64	**8**	**16**	21	**32**	32	32	32	**64**	64	64	64	64	64	64	64
9	72	**8**	14	**24**	24	36	36	36	36	**72**	72	72	72	72	72	72
10	80	**8**	**16**	20	27	**40**	40	40	40	40	**80**	80	80	80	80	80
11	88	**8**	15	22	29	29	44	44	44	44	44	**88**	88	88	88	88
12	96	**8**	**16**	**24**	**32**	32	**48**	48	48	48	48	48	**96**	96	96	96
13	104	**8**	15	21	26	35	35	52	52	52	52	52	52	**104**	104	104
14	112	**8**	**16**	22	28	37	37	**56**	56	56	56	56	56	56	**112**	112
15	120	**8**	15	**24**	30	**40**	40	40	60	60	60	60	60	60	60	**120**
16	128	**8**	**16**	21	**32**	32	43	43	**64**	64	64	64	64	64	64	64
17	136	**8**	15	23	27	34	45	45	45	68	68	68	68	68	68	68
18	144	**8**	**16**	**24**	29	36	**48**	48	48	**72**	72	72	72	72	72	72
19	152	**8**	15	22	30	38	38	51	51	51	76	76	76	76	76	76
20	160	**8**	**16**	23	**32**	**40**	40	53	53	53	**80**	80	80	80	80	80
21	168	**8**	15	**24**	28	34	42	**56**	56	56	56	84	84	84	84	84
22	176	**8**	**16**	22	29	35	44	44	59	59	59	**88**	88	88	88	88
23	184	**8**	15	23	31	37	46	46	61	61	61	61	92	92	92	92
24	192	**8**	**16**	**24**	**32**	38	**48**	48	**64**	64	64	64	**96**	96	96	96
25	200	**8**	15	22	29	**40**	40	50	50	67	67	67	67	100	100	100
26	208	**8**	**16**	23	30	35	42	52	52	69	69	69	69	**104**	104	104
27	216	**8**	15	**24**	31	36	43	54	54	**72**	72	72	72	72	108	108
28	224	**8**	**16**	22	**32**	37	45	**56**	56	56	75	75	75	75	**112**	112
29	232	**8**	15	23	29	39	46	46	58	58	77	77	77	77	77	116
30	240	**8**	**16**	**24**	30	**40**	**48**	48	60	60	80	80	80	80	80	**120**

This table is based upon the assumptions that the child care is 8 hours in length (TO) and that the full enrollment is present for the full 8 hours (TH). This is unlikely to ever occur but it gives us a reference point to measure adult child contact hours in the most efficient manner. Based upon the relationship between TO and TH based upon the algorithms, select from one of the formulae from the previous page (formulae 1 - 4) to determine how well the actual Relatively Weighted Contact Hours (RWCH) match with this table. If the RWCH exceed the respective RWCH in this table, then the facility would be over ratio on ACR standards, in other words, they would be overpopulated.

eBook
www.bookemon.com

rfiene@rikinstitute.com

Figure 1: Contact Hour Diagram Paradigm and Schematic



The above diagram (Figure 1) depicts how the number of staff and children help to construct the contact hour formula. Depending on when the children arrive and leave could change the shape from a trapezoid to a rectangle or square or triangle. Please see the following potential density distributions which could impact these changes in the above contact hour diagram.

eBook
www.bookemon.com

rfiene@rikinstitute.com

Potential Density Distributions
Taking into Account Number of Children, Staff, and Exposure Time

Here are some basic key relationships or elements related to the Contact Hour (CH) methodology.

- RWCH = ACR
- CH = GS = NC
- NC and CH are highly correlated
- ACR and GS are static, not dynamic
- CH makes them dynamic by making them 2-D by adding in Time (T)
- ΣACR = GS
- GS = total number of children NC
- ACR = children / adult

ACR = Adult Child Ratio, GS = Group Size, RWCH = Relatively Weighted Contact Hours, NC = Number of Children.

Possible Density Displays of Contact Hours (Horizontal Axis = Time (T); Vertical Axis = NC):

This density distribution should result in the lowest CH but probably not very likely to occur. Essentially what would happen is that full enrollment would be a single point which means that the last child arrives when the first child is leaving. Very unlikely but possible.

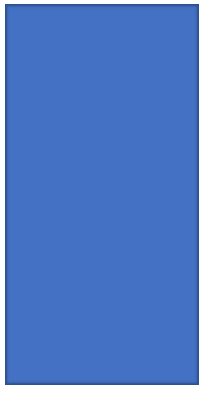
This density distribution is probably the most likely scenario when it comes to CH in which the children gradually, albeit rather steeply, arrive at the facility and also leave the facility gradually. They don't all show up at the same time nor leave at the same time. However, the arriving and leaving will be a rather close time frame.

eBook
www.bookemon.com

rfiene@rikinstitute.com

This scenario is unlikely but is used as the reference point for CH because it provides the most efficient model. This is where all the children arrive and leave at the same time. Very unlikely, but I guess it could happen. The important element here is its efficiency in that all contact hours are covered, so although a lesser amount of CH is not as efficient it does demonstrate compliance with ACR and GS which is one of the purposes of CH. As the bottom two distributions will demonstrate, CHs above this level would either depict a program that is open for an extended time or where there are too many children present and the facility is out of compliance with GS and/or ACR.

This distribution would indicate that the facility is open for an extended time and exceeds the number of total CH as depicted in the reference square standard. Although not out of compliance with GS or ACR, this could become a determining factor when looking at the potential overall exposure of adults and children when we are concerned about the spread of an infectious diseases, such as what happened with COVID19. Are facilities that are high on a CH measurement more prone to the spread of infectious diseases?



This depiction clearly indicates a very high CH and non-compliance with ACR and GS. This is the reason for designing the CH methodology which was to determine these levels of regulatory compliance as its focus.

eBook
www.bookemon.com

rfiene@rikinstitute.com

Section 3: Program Quality Indicators

This section provides the program quality indicators (PQI) which along with the previous section dealing with staff child ratios and group sizes constitutes the new Integrated Program Monitoring system: CCEE Heart Monitor (CCEEHM App). These PQI were validated in a study in the province of Saskatchewan (Fiene, 2024).

The PQI represents staffing, program, parental involvement and key interactional observation indicators drawn from key indicator studies from 1980 - 2020 involving quality rating and improvement systems (QRIS), professional development, and program quality initiative observational studies. These indicators provide the process quality within the context of the structural quality provided by the contact hour metric depicted in the previous section. Both the contact hour and these PQI are intended to be used in an integrated fashion and compliance should be measured on both domains. By doing this a picture of structural and process quality will be possible.

By utilizing this new integrated program monitoring system it will provide a cost effective and efficient system for jurisdictions around the world. These metrics are based upon research studies completed in the USA and Canada from 2020-2024 (Fiene, 2025a,b,c).

eBook
www.bookemon.com

rfiene@rikinstitute.com

INDICATOR 1): Number of ECE III Educators (AA and BA Level ECE Educators)

AI will review staff records to determine the number of staff who have these credentials in early childhood education. Record the number of ECEs with the appropriate qualifications and divide them by the total number of ECEs to come up with a percent for the center.

How to Measure:

Go to a Staff Information Summary form to obtain the data for this item. Under Certification, look for the following: Certification Date and Certification Level (Highest ECE Level Certified). The certification date should be earlier than the date of the review and the actual level of the certification. In this case, we are interested in the number of (ECEIII's). Record the number of ECEIII working at least 65 hours/month. Then record the number of total teaching staff working at least 65 hours/month below as well. Teaching staff is defined as staff who have a responsibility for working with the children and the programming. Determine the percentage by dividing the total number of staff into the total number of ECEIII Certified teaching staff, ECEIII Certified teaching staff is the numerator, and the total number of teaching staff is the denominator (ECEIII/Total number of teaching staff x 100% = Percent).

Scoring for PQI 1:

The total number of ECEIII Certified teaching staff _____(1.1)

The total number of teaching staff _____(1.2)

Total ECEIII teaching staff divided by the total number of teaching staff _____

(%). Then based on the percentage, you can find the score of 1-4 as per the chart below.

Circle the Appropriate Level	***1 = 0 to 25%***	***2= 26 to 50%***	***3 = 51 to 75%***	***4 = 76 to 100%***

INDICATOR 2): Stimulating and Dynamic Environment

The criteria for measuring this are drawn from Play and Exploration Guides that should be present in all CCEE programs. The program should be child centered. Children are viewed as competent learners, and they have the freedom to access classroom materials independently without adult intervention. The children are provided with meaningful choices through activity/learning centers. There is evidence of the children's interests and their projects in the learning environment.

How to Measure:

Below is the checklist of items that should be present to assess if the environment is both stimulating and dynamic for the children. You will want to observe that the following items are occurring in the classroom first. If you do not actually observe it occurring, then check the program plan to find documentation that it normally occurs but you just did not observe today. The checklist items would be found in *Play and Exploration* foundational materials.

eBook www.bookemon.com

rfiene@rikinstitute.com

Quality Early Learning Environments (Please record all that you observe Y or N):

1. Co-teaching is evident. Y/N _____(2.1)
2. Children are viewed as competent learners & can access materials independently. Y/N ____(2.2)
3. Authentic and meaningful materials are used with children. Y/N _____(2.3)
4. Children are provided with meaningful choices. Y/N _____(2.4)
5. Children's work, art and photos are displayed respectfully. Y/N _____(2.5)
6. Family photos are displayed in the early learning program. Y/N _____(2.6)
7. Documentation of learning is displayed and discusses holistic development. Y/N _____(2.7)
8. Environment reflects the culture and beliefs of the children, families and staff. Y/N _____(2.8)
9. Variety of books & other print materials are available throughout the classroom Y/N _____(2.9)
10. A variety of writing materials are accessible to children most of the time. Y/N _____(2.10)
11. There is evidence of the children's interests & projects in the classroom. Y/N _____(2.11)

Scoring for PQI 2:

Total up the number of items where you recorded a "Y" above that you observed (curriculum or in classrooms), divide by 11 x 100% to come up with a percent and record here _____%. Then based on the percentage, you can find the score of 1-4 as per the chart below.

Circle the Appropriate Level	***1 = 0 to 25%***	***2= 26 to 50%***	***3 = 51 to 75%***	***4 = 76 to 100%***

INDICATOR 3): Developmentally Appropriate Curriculum Based on Assessments of Each Child

The key for this quality key indicator is that the program is following an individualized prescribed planning document when it comes to curriculum. It does not mean it is a canned program, in fact, it shouldn't if it is based upon the individual needs of each child's developmental assessment. The assessor will ask to see what is used to guide the curriculum. There should be a written document that clearly delineates the parameters of the philosophy, activities, guidance, and resources needed for the particular curricular approach. There should also be a developmental assessment which is clearly tied to the curriculum. The developmental assessment can be home-grown or a more standardized off-the-shelf type of assessment, the key being its ability to inform the various aspects of the curriculum. The purpose of the assessments is not to compare children but rather to compare the developmental progress of individual children as they experience the activities of the curriculum.

The following key elements should be present when assessing this quality indicator.

- 1) The program practices emergent curriculum, allowing the interests of the children to determine the learning content. The curriculum is informed by individual developmental assessments of each child in the respective classrooms.
- 2) The children and educators are co-learners in the exploration of projects.
- 3) Learning activities of the children are documented, displayed in the learning environment and used to plan further learning activities. This can be assessed developmentally.

eBook
www.bookemon.com

rfiene@rikinstitute.com

How to Measure:

Take a sample of 10 individual children's records and consider the above three elements for EACH record. You should be asking yourself if there is a clear link between an assessment and the developmentally appropriate curriculum so that an individualized learning approach is being undertaken and each child's developmental needs are taken into consideration. These records could be formal, such as portfolios kept for each child or a more informal, anecdotal type of record keeping. The key is that there is a record that can be looked at. It is not adequate if the teacher says they do it from memory – it needs to be written down and documented.

Cross check the child's record to the actual curriculum. Record all the instances (Y's) in which this occurs. All three blocks need to be checked for each record (1-10).

Emergent Curriculum is Practiced (3.1)

1 Y/N	2 Y/N	3 Y/N	4 Y/N	5 Y/N	6 Y/N	7 Y/N	8 Y/N	9 Y/N	10 Y/N

Key Element 1 +

Children and Educators are Co-learners (3.2)

1 Y/N	2 Y/N	3 Y/N	4 Y/N	5 Y/N	6 Y/N	7 Y/N	8 Y/N	9 Y/N	10 Y/N

Key Element 2 +

Learning Activities are Documented and Displayed and Used to Plan Future Learning (3.3)

1 Y/N	2 Y/N	3 Y/N	4 Y/N	5 Y/N	6 Y/N	7 Y/N	8 Y/N	9 Y/N	10 Y/N

Key Element 3 +

All three key elements must have a Y to get an overall score of Y. If all three key elements have a Y for that individual record, then record Y in the corresponding block in the overall score.

1 Ys =	2 Ys =	3 Ys =	4 Ys =	5 Ys =	6 Ys =	7 Ys =	8 Ys =	9 Ys =	10 Ys =

= Total of All Three Key Elements (3.4)

Scoring for PQI 3:

The number of positive records (all Ys for all three elements) where there is a crosswalk from developmental assessment to curriculum _____

Percent of positive records (all Ys) (divide the number of positive records by 10 x 100%) _____%. Then based on the percentage, you can find the score of 1-4 as per the chart below.

eBook
www.bookemon.com

rfiene@rikinstitute.com

Circle the Appropriate Level	*1 = 0 to 25%*	*2= 26 to 50%*	*3 = 51 to 75%*	*4 = 76 to 100%*

INDICATOR 4): Opportunities for Staff and Families to Get to Know Each Other

There should be activities both within the center as well as off site where staff and parents have opportunities to meet and greet each other. Communication with family members is documented and enables early childhood providers to assess the need for follow-up. Early childhood providers hold regular office hours when they are available to talk with family members either in person or by phone. Family members are encouraged to lead the conversation and to raise any questions or concerns.

How to Measure:

Look for the following 3 examples in policies developed by the program and determine if they have been carried out with families. It will be necessary to interview staff to complete this indicator if you do not find the three examples in policies:

1. The program provides communication, education, and informational materials & opportunities for families that are delivered in a way that meets their diverse needs. Y/N_____(4.1)
2. The program communicates with families using different modes of communication, and at least one mode promotes two-way communication. Y/N _____(4.2)
3. The program demonstrates respect and engages in ongoing two-way communication. The program respects each family's strengths, choices, & goals for their children. Y/N _____(4.3)

Scoring for PQI 4:

Record the number of Yes's (Y's): _____(Range: 0 – 3) (Divide by 3 x 100% = _____%). Then based on the percentage, you can find the score of 1-4 as per the chart below.

Circle the Appropriate Level	*1 = 0 to 25%*	*2= 26 to 50%*	*3 = 51 to 75%*	*4 = 76 to 100%*

INDICATOR 5): Families Receive Information on Their Child's Progress Regularly Using a

Formal Mechanism

Based upon Indicator #3 above, the information gleaned from the developmental assessments should be the focus of the report or parent conference. Parental feedback about the assessment and how it compares to their experiences at home would be an excellent comparison point. All these interactions should be done in a culturally and linguistically appropriate way representing the parents being served.

How to Measure:

Look for the following four examples in policies developed by the program and determine if they have been carried out with families. Record the number of reports completed or parent conferences over the past year. It will be necessary to interview staff to complete this indicator if you cannot determine from records that the conferences or reports were completed.

eBook
www.bookemon.com

rfiene@rikinstitute.com

- 1) The program does have regularly scheduled (at least 2xs/year) parent conferences in which the children's developmental progress is discussed AND provides the family with a report of their child's developmental progress. Y/N _____(5.1) (Score 3 points). If "Yes" then go to Number 4. If "No", then go to numbers 2 and 3.
- 2) The program has regularly scheduled (at least 2xs/year) parent conferences in which the children's developmental progress is discussed, but it does not provide a report to the parents on their child's developmental progress. Y/N _____(5.2) (Score 2 points).
- 3) If the program does not have regularly scheduled (at least 2xs/year) parent conferences, does it provide the family with a report of their child's developmental progress. Y/N _____(5.3) (Score 1 point). Go to Number 4.
- 4) All these interactions are done in a culturally and linguistically appropriate way representing the parents being served. Y/N _____(5.4) (Score 1 point)

Scoring for PQI5:

Add up the total points based on the Ys; this will range from "0" to "4". The only way a program can receive a "4", is if a program has regularly scheduled parent conferences at least 2xs/year and provides the family with a report of their child's progress; and it is done in a culturally and linguistically appropriate way.

Record the number of points: _____(Range: 0 - 4)

Total Score for Part 1 = _____

PART 2 - OBSERVATIONS:

INDICATOR 6): Educators Encourage Children to Communicate (Preschool Class)

Assessors will need to observe this item when they do their classroom observations. Initially you can ask educators or the director how children are encouraged to communicate but in order to gather reliable and valid information regarding this question/standard, it needs to be observed in the various interactions between staff and children. Things to look for would be more back and forth conversations rather than one-way conversations where educators are telling children what to do. Look for opportunities where children can describe what they are doing, how they feel about what they are doing, and why they are doing particular activities. Educators expand upon children's conversation.

These opportunities can occur anywhere in the classroom or outside, such as in dramatic play, tabletop activities or on the playground. Materials should be present that encourage communication such as toy telephones, puppets, flannel boards, dolls and dramatic play props, small barns, fire stations, or dollhouses. These create a lot of conversation among children as they assume many different roles.
Children also talk when there is an interested person who listens to them. The staff in a high-quality early childhood classroom will use both activities and materials to encourage growth in communication skills.

How to Measure:

Observe the classroom for a minimum of 15 minutes. Once completed, consider where the classroom

eBook
www.bookemon.com

rfiene@rikinstitute.com

falls based on the following scale;
Score the classroom a 1 if the following occur:

- No activities used by staff with children to encourage them to communicate, for example: non talking about drawings, dictating stories, sharing ideas at circle time, finger plays, singing songs. Y/N _____(6.1)
- Very few materials accessible that encourage children to communicate. Y/N _____(6.2)

Score the classroom a 2 if the following occur (If the classroom does not have all 3 indicators but has 2 of the indicators then score this item 1+):

- Some activities are used by staff w/children to encourage them to communicate. Y/N _____ (6.3)
- Some materials are accessible to encourage children to communicate. Y/N _____(6.4)
- Communication activities are generally appropriate for the children in the group. Y/N _____ (6.5)

Score the classroom a 3 if the following occur (If the classroom does not have both indicators but has one of the indicators then score this item 2+):

- Communication activities take place during both free play and group times, for example: child dictates story about painting; small group discusses trip to store. Y/N _____(6.6)
- Materials that encourage children to communicate are accessible in a variety of interest centers, for example: small figures and animals in block area; puppets and flannel board pieces in book area; toys for dramatic play outdoors or indoors. Y/N _____(6.7)

Score the classroom a 4 if the following occur (If the classroom does not have both indicators but has one of the indicators then score this item 3+):

- Staff balance listening and talking appropriately for age and abilities of children during communication activities, for example: leave time for children to respond; verbalize for child with limited communication skills. Y/N _____(6.9)
- Staff link children's spoken communication with written language, for example: write down what children dictate & read it back to them; help them write notes to parents. Y/N _____ (6.10)

Scoring for PQI 6:

Total up the number of "Y's" and record the appropriate level. In order for a classroom to receive a particular score, all "Y's" must be checked for the appropriate level (1 - 4) from above or partial credit given in order to obtain a "+". If there is a "+" please also mark it in the box.

Circle the Appropriate Level	***1***	***2***	***3***	***4***

eBook
www.bookemon.com

rfiene@rikinstitute.com

INDICATOR 7): Infant Toddler Observation (if applicable) **(Infant Classroom)**

Conversations and questions should be used with all children, even young infants. Conversations using verbal and nonverbal turn-taking should be considered when scoring. Most conversations and questions initiated by infants will be nonverbal, such as widening of baby's eyes or waving arms and legs. Observe staff response to such nonverbal communication. For infants and toddlers, the responsibility for starting most conversations and asking questions belongs to the staff. As children become more able to initiate communication, staff should modify their approach in order to allow children to take on a greater role in initiating conversations and asking questions. Staff should provide answers to questions used by children if children cannot answer, and as children become more able to respond, questions should start to include those that the child can answer. If there was not an infant classroom, skip this Indicator and please note that here and on the summary score sheet by marking N/A: _____

How to Measure:

Observe the classroom for a minimum of 15 minutes. Once completed, consider where the classroom falls based on the following scale;

Score the classroom a 1 if the following occurs:

- Staff never initiate turn-taking conversations with children, for example: rarely encourage baby to babble back; simple back and forth exchanges with verbal children never observed. Y/N _____(7.1)
- Staff questions are often not appropriate for children, or no questions are asked, for example: too difficult to answer; carry a negative message. Y/N _____(7.2)
- Staff respond negatively when children can't answer questions, for example: "You should know this"; "You did not listen". Y/N _____(7.3)

Score the classroom a 2 if the following occurs (If the classroom does not have all 3 indicators but has 2 of the indicators then score this item 1+):

- Staff sometimes initiate conversations with children, for example: babble back and forth with baby; copy baby's sounds; respond to baby's crying with verbal response; have short back and forth toddler interactions. Y/N _____(7.4)
- Staff sometimes ask children appropriate questions and wait for the child to respond, for example: ask baby if she likes toy and pay attention as baby smiles; ask toddler what he is eating and wait for him to think of word. Y/N _____(7.5)
- Staff respond neutrally or positively to children who can't answer questions. Questions asked are sometimes meaningful to children, for example: child responds with interest; does not ignore staff questions. Y/N _____(7.6)

Score the classroom a 3 if the following occurs (If the classroom does not have all 4 indicators but has 2 or more of the indicators then score this item 2+):

- Staff initiate engaging conversations with children throughout the observation, for example: show enthusiasm; use tone that attracts child's attention. Y/N _____(7.7)
- Staff often personalize questions and/or conversations for individual children, for example: talk about children's families, preferences, interests; what they are playing with; what they did over weekend; child's mood; use child's name. Y/N _____(7.8)

eBook
www.bookemon.com

rfiene@rikinstitute.com

- Staff often pay attention to children's questions, verbal or nonverbal, and answer in a satisfying manner for the child. Y/N _____(7.9)
- Staff ask questions in which children show interest in answering, for example: make the questions funny or mysterious; use attractive tone; meaningful and not too difficult to answer. Y/N _____(7.10)

Score the classroom a 4 if the following occurs (If the classroom does not have both indicators but has one of the indicators then score this item 3+):

- Staff frequently have turn taking conversations with children throughout the observations. Many appropriate questions are used throughout the observation, during both play and routines. Y/N _____(7.11)
- Staff ask children appropriate questions, wait a reasonable time for child response, and then answer if needed, for example: "Are you hungry? . . . Yes, you are!"; "Where's the ball? . . . These it is! You found the ball". Y/N _____(7.12)

Scoring for PQI 7:

Total up the number of "Y's" and record the appropriate level. For a classroom to receive a particular score, all "Y's" must be checked for the appropriate level (1 - 4) from above or partial credit given in order to obtain a "+".

Circle the Appropriate Level	***1***	***2***	***3***	***4***

INDICATOR 8): Educators Use Language to Develop Reasoning Skills (Preschool)

Assessors will need to observe very carefully as this standard can be difficult to determine because it is tying language and cognition together. Again, this opportunity can occur in any setting in or out of the classroom because it is the basis for problem solving through the use of language. Also look for educators redirecting children's conversations when appropriate. Staff should use language to talk about logical relationships using materials that stimulate reasoning. Through the use of materials, staff can demonstrate concepts such as same/different, classifying, sequencing, one-to-one correspondence, spatial relationships, and cause and effect.

How to Measure:

Observe the classroom for a minimum of 15 minutes. Once completed, consider where the classroom falls based on the following scale;

Score the classroom a 1 if the following occur:

- Staff do not talk with children about logical relationships, for example: ignore children's questions and curiosity about why things happen, do not call attention to sequence of daily events, differences and similarity in number, size, shape, cause and effect. Y/N _____(8.1)
- Concepts are introduced inappropriately, for example: concepts too difficult for age and abilities of children, inappropriate teaching methods used such as worksheets without any concrete experiences; teacher gives answers w/o helping children to figure things out. Y/N _____(8.2)

Score the classroom a 2 if the following occur (If the classroom does not have both indicators but has one of the indicators then score this item 1+):

- Staff sometimes talk about logical relationships or concepts, e.g.: explain that outside time comes after snacks, point out differences in sizes of blocks children use. Y/N _____(8.3)

eBook
www.bookemon.com

rfiene@rikinstitute.com

- Some concepts are introduced appropriately for ages and abilities of children in group, using words and experiences, for example: guide children with questions and words to sort big and little blocks or to figure out why ice melts. Y/N _____(8.4)

Score the classroom a 3 if the following occur (If the classroom does not have both indicators but has one of the indicators then score this item 2+):

- Staff talk about logical relationships while children play with materials that stimulate reasoning, for example: sequence cards, same/different games, size and shape toys, sorting games, numbers and math games. Y/N _____(8.5)
- Children are encouraged to talk through or explain their reasoning when solving problems, for example: why they sorted objects into different groups, in what way two pictures are the same or different. Y/N _____(8.6)

Score the classroom a 4 if the following occur (If the classroom does not have both indicators but has one of the indicators then score this item 3+):

- Staff encourage children to reason throughout the day, using actual events and experiences as a basis for concept development, e.g.: children learn sequence by talking about their experiences in the daily routine or recalling the sequence of a cooking project. Y/N _____(8.7)
- Concepts are introduced based upon children's interests or needs to solve problems, for example: talk children through balancing a tall block building, help children figure out how many spoons are needed to set a table. Y/N _____(8.8)

Scoring for PQI 8:

Total up the number of "Y's" and record the appropriate level. In order for a classroom to receive a particular score, all "Y's" must be checked for the appropriate level (1 - 4) from above or partial credit given in order to obtain a "+".

Circle the Appropriate Level	***1***	***2***	***3***	***4***

For quality key indicators 9 and 10 it is recommended that these be assessed/observed throughout the observation period and not just during key activity times. These two quality key indicators should be observed in two-minute blocks over ten sequences for a total of 20 minutes. These two items should also be used with each age group being assessing.

INDICATOR 9): Educators Listen Attentively When Children Speak

This quality indicator focuses on the early childhood educator(s) looking directly at the children with nods, rephrasing their comments, and engaging in conversations. Children should have the undivided attention of the specific educator they are addressing. Educators should not be looking away or pre-occupied with others. They should be at the child's level making eye contact. The intent is to observe all children and educators in the room.

How to Measure:

Do this in timed 2-minute observations recording each time you observe this occurring. Record at least 10 different observation periods. These do not need to be consecutive in order to fully observe classrooms and educators. Please use the following scale to assess your recordings: Likert Scale (1-4) where 1 = Never/Not at All; 2 = Somewhat/Few Instances; 3 = Quite a Bit/Many Instances; 4 = Very Much/Consistently):
Make the actual recordings using the Likert Scale (1-4) above for each individual observation and record in each cell below.

eBook
www.bookemon.com

rfiene@rikinstitute.com

09 Observations:

09.1	2	3	4	5	6	7	8	9	09.10

Scoring for PQI 9:

Once all the observations are made, add up the results from the Likert Scale (1-4) and record the total number here: _____(Range: 10 - 40)(Divide this result by 10) = _____(1-4)(Round upward or downward to the whole number (3.7 = 4; 2.2 = 2)).

Circle the Appropriate Level	***1***	***2***	***3***	***4***

INDICATOR 10): Educators Speak Warmly to Children

This quality indicator focuses on the early childhood educator(s) always engaging in a caring voice and body language with every child. Educators do not use harsh language or commands in speaking to children, but rather again are on the child's level making eye contact. Think of the way Fred Rogers would engage his audience where you always felt you were the most important person in the world when he talked to the TV.

How to Measure:

Do this in timed 2-minute observations recording each time you observe this occurring. Record at least 10 different observation periods. Please use the following scale to make your recordings: (This item is on a Likert Scale (1-4) where 1 = Never/Not at All; 2 = Somewhat/Few Instances; 3 = Quite a Bit/Many Instances; 4 = Very Much/Consistently):
Make the actual recordings using the Likert Scale (1-4) above for each individual observation and record in each cell below.
10 Observations:

10.1	2	3	4	5	6	7	8	9	10.10

Scoring for PQI 10:

Once all the observations are made, add up the results from the Likert Scale (1-4) and record the total number here: _____(Range: 10 - 40) (Divide this result by 10) = _____(1-4).
(Round upward or downward to the whole number (3.7 = 4; 2.2 = 2)).

Circle the Appropriate Level	***1***	***2***	***3***	***4***

eBook
www.bookemon.com

rfiene@rikinstitute.com

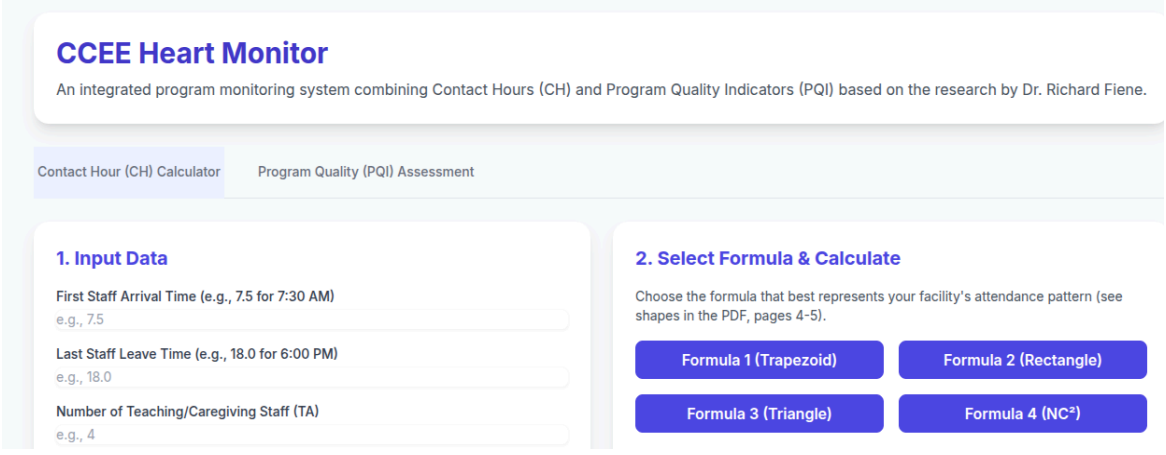
Program Quality Indicators Artificial Intelligence (PQIAI) Scoring Protocol

LEVEL	Standardized Scores	Actual Scores
High Quality	Mixed Age: 36+ Preschool: 32+ Infant-Toddler: 28+	Mixed Age: _____ Preschool: _____ Infant-Toddler: _____
High - Mid Quality	Mixed Age: 30 – 35 Preschool: 26 - 31 Infant-Toddler: 22 - 27	Mixed Age: _____ Preschool: _____ Infant-Toddler: _____
Mid – Low Quality	Mixed Age: 20 – 29 Preschool: 16 - 25 Infant-Toddler: 12 - 21	Mixed Age: _____ Preschool: _____ Infant-Toddler: _____
Low Quality	Mixed Ages: 19 or less Preschool: 15 or less Infant-Toddler: 11 or less	Mixed Age: _____ Preschool: _____ Infant-Toddler: _____

eBook
www.bookemon.com

rfiene@rikinstitute.com

Here is the opening screen to the Child Care and Early Education Heart Monitoring App (CCEEHM):



Here is the CCEE Heart Monitor Application: The ***Child Care and Early Education Integrated Program Monitoring System.*** It has two main sections, accessible through tabs:

1. **Contact Hour (CH) Calculator:** Input your facility's operational data to calculate the Contact Hour metric, which helps in analyzing structural quality. You can also include square footage for an expanded calculation.
2. **Program Quality (PQI) Assessment:** Go through the 10 indicators to evaluate the process quality of an early education program. The tool will automatically score each indicator and provide a final quality level based on the age group you select.

You can fill out the forms in each section and the application will compute the results for you in real-time. The tools that go along with these forms are appended to this document after the source code. You will need the tools for data collection and for interpreting the results from the Application so review these before opening the App. It will help familiarize you with the key data elements and the scoring system for this program monitoring systems approach.

The link to the CCEE Heart Monitor:

Alpha Version

https://g.co/gemini/share/f5397233272a

Beta Version

https://g.co/gemini/share/13dafe5005e9

---

eBook
www.bookemon.com

rfiene@rikinstitute.com

References:

Fiene, R. (2025a). Potential Solution to the Child Care Trilemma Revisited: Finding the "Right Rules" - The Holy Grail of Early Care and Education, *Exchange*, Summer 2025, pps 64-66.

Fiene, R. (2025b). Finding the Rules that Work: An emerging paradigm promised to close the gap between regulatory compliance scores and quality of childcare services. *American Scientist, 113, 16-21, (January-February 2025).*

Fiene, R. (2025c). The Uncertainty–Certainty Matrix for Licensing Decision Making, Validation, Reliability, and Differential Monitoring Studies. *Knowledge*, *5*(2), 8. https://doi.org/10.3390/knowledge5020008

Fiene, R. (2024). *Regulatory Compliance and Monitoring Systems*. Research Institute for Key Indicators and National Association for Regulatory Administration.

Freer, R. & Fiene, R. (2023). Regulatory Compliance and Quality Programs: Constraints and Opportunities for Integration. *Journal of Regulatory Science*, *11*(1), 1-10. https://doi.org/10.21423/JRS.REGSCI.111264

Fiene, R. (2022). Regulatory compliance monitoring paradigms and the relationship of regulatory compliance/licensing with program quality: A policy commentary. *Journal of Regulatory Science 10:1–7*.

Fiene, R. & Stevens, S. (2021). *Contact Hours as a New Metric Replacing Group Size and Staff-Child Ratios as well as a New Metric for COVID19 Thresholds.* Research Institute for Key Indicators/Penn State.

Fiene, R. (2019). A treatise on the theory of regulatory compliance*, Journal of Regulatory Science*, *Volume 7(1), pps 1-3.* (doi.org/10.21423/jrs-v07fiene).

Kontos, S. & Fiene, R. (1987). Child care quality, compliance with regulations, and children's development: The Pennsylvania Study, in *Quality in Child Care: What Does Research Tell Us?*, Phillips, editor, Washington, D.C.: National Association for the Education of Young Children.

Fiene, R. & Nixon, M. (1985). Instrument based program monitoring and the indicator checklist for child care, *Child Care Quarterly, 14*(3), 198-214.

eBook
www.bookemon.com

rfiene@rikinstitute.com

Biography

Dr Richard Fiene, a research psychologist, has spent his professional career in improving the quality of child care in various states, nationally, and internationally. He has done extensive research and publishing on the key components in improving child care quality through an Early Childhood Program Quality Indicator Model (ECPQIM) of training, technical assistance, quality rating & improvement systems, professional development, mentoring/coaching, regulatory science, licensing, risk assessment, differential program monitoring, key indicators, and accreditation. His research has also made significant contributions in regulatory science related to measurement and monitoring systems, such as instrument-based program monitoring, differential monitoring, key indicator methodology for compliance and quality, and risk assessment methodology. In prevention science, his research has led to the identification of key Regulatory indicators that keep children healthy and safe while in out of home child care settings.

Dr Fiene is a Professor of Psychology (ret) (Penn State University) and founding director of the Capital Area Early Childhood Research and Training Institute. He is presently a Research Psychologist and Regulatory Prevention Scientist for the Research Institute for Key Indicators, an affiliated data laboratory with the Edna Bennett Pierce Prevention Research Center at the Pennsylvania State University.

Dr Fiene is regarded as a leading international researcher/scholar on human services licensing measurement and differential monitoring systems. His regulatory compliance law of diminishing returns has altered human services regulatory science and licensing measurement dramatically in thinking about how best to monitor and assess licensing rules and regulations through targeted and abbreviated inspections. The theory has also led to the issuing of human service licenses based on substantial regulatory compliance with all rules rather than full 100% regulatory compliance with all rules. This was a basic licensing and public policy paradigm shift which has impacted regulatory administration.

His research has led to the following developments: identification of herding behavior of two year olds, spatial acquisition device in young children & four states of space, national early care and education quality indicators, mathematical model (Contact Hours) for determining adult child ratio compliance, solution to the trilemma (quality, affordability, and accessibility) in child care delivery services, Stepping Stones to Caring for Our Children, NECPA: National Early Childhood Program Accreditation, online coaching as a targeted and individualized learning platform, validation framework for early childhood licensing systems and quality rating & improvement systems, an Early Childhood Program Quality Improvement & Indicator Model for better public policy decision making, Caring for Our Children Basics, Abbreviated Program Monitoring Inspections, Validation Framework for Licensing, Generic Key Indicator Rules, Regulatory Compliance Scoring Scale, RegalMetrics, and has led to the development of statistical techniques for dealing with highly skewed, non-parametric data distributions in human services licensing and regulatory systems, such as data dichotomization.

eBook
www.bookemon.com

rfiene@rikinstitute.com

Dr Fiene had a long career in academia and governmental service. He was a research psychologist and regulatory scientist during his tenure with the Commonwealth of Pennsylvania's Office of Children, Youth, and Families and the Office of Licensing and Regulatory Administration where he was the research director for both offices. In academia he was a professor of psychology and human development at both the University of North Carolina and the Pennsylvania State University. At Penn State Harrisburg he was Department Head for both the psychology and human development programs during his tenure at the university.

At the national and international levels, Dr Fiene has been a senior research consultant to the National Association for Regulatory Administration, the Federal Office of Child Care, the Administration for Children and Families, and the Federal Department of Health and Human Services. His research has been disseminated to all 50 states and over 120 countries. In 2019, he was elected to the Early Childhood Exchange Leadership Initiative. He received the 2020 Distinguished Career Award from the Pennsylvania Association for the Education of Young Children. In 2023, his Key Indicator methodology for quality indicators received a Recognized Project of the Child Impact Initiative of the World Forum Foundation. Dr Fiene remains active in the regulatory prevention science and early childhood fields through the Edna Bennett Pierce Prevention Research Center at Penn State where he remains an affiliated faculty and a senior research psychologist. He has been a member of the American Psychological Society.

eBook
www.bookemon.com

rfiene@rikinstitute.com

Research Proposal: Funding for the Development and Implementation of the AI-Powered Child Care and Early Education Heart Monitor (CCEEHM)

1.0 Introduction: The Challenge of Measuring Early Childhood Education Quality

The strategic importance of high-quality Child Care and Early Education (CCEE) is undisputed, yet the field has long been constrained by an inadequate approach to quality measurement. For decades, a methodological schism has separated the assessment of structural and process quality into disconnected domains. This bifurcated system has systematically obstructed the development of valid, holistic quality assurance frameworks, keeping the field stagnant and hindering our ability to gain a meaningful understanding of the environments that shape children's futures.

This proposal confronts this long-standing barrier by defining and, for the first time, truly integrating the two critical components of quality:

- **Structural Quality:** Refers to the foundational, regulated aspects of a program, including elements like staff-child ratios, group size, and health and safety regulations. These are the essential inputs that create the basic conditions for care.
- **Process Quality:** Encompasses the dynamic, moment-to-moment interactions between staff and children. It is widely considered the "heart" of quality—the developmental "magic" that occurs in the dance between an educator and a child.

The inadequacy of the current approach is stark. Distinct tools are used by different professionals; licensing inspectors focus on structural compliance, while specialized observers assess process quality. This division yields an incomplete and inefficient picture, failing to capture how structural elements directly support or constrain the

eBook
www.bookemon.com
rfiene@rikinstitute.com

interactional quality that is paramount for child outcomes. It treats the framework and the heart as two separate entities when they are, in fact, profoundly interconnected.

To resolve this, we propose the **Child Care and Early Education Heart Monitor (CCEEHM)**, the necessary evolution of regulatory science. This proposal seeks funding to develop and implement the CCEEHM, a unified system designed to merge the measurement of structural and process quality into a single, efficient, and technologically advanced platform. This integrated approach is grounded in a robust theoretical framework that provides a clear rationale for unifying these once-separate domains.

2.0 Theoretical Framework: Unifying Structural and Process Quality

A strong theoretical foundation is essential for the development of any new measurement system, ensuring it is a conceptually sound innovation rather than an ad-hoc collection of tools. The CCEEHM operationalizes a modern, integrated theory of regulatory science, built upon established scholarly work that provides a cohesive rationale for its design. This framework ensures that the proposed system is robust, valid, and aligned with the future of the CCEE field.

The CCEEHM's design synthesizes three foundational concepts in a hierarchical structure:

- **The Overarching Philosophical Framework:** The **Theory of Regulatory Compliance** (Fiene, 2019; 2021; 2025a,b) provides the unifying philosophy, positing that structural and process quality are not independent but are interconnected components within a single, comprehensive regulatory system. The CCEEHM is the first tool to fully operationalize this theory.
- **The Core Methodological Principle:** The **Key Indicator Methodology (KIM)** (Fiene & Nixon, 1985) serves as the core principle ensuring the CCEEHM is practical and efficient, not just theoretically sound. By focusing on the most predictive and essential measures of quality, KIM ensures the system is a cost-effective monitoring tool viable for widespread adoption.
- **The Applied Model:** The **Integrated Monitoring Systems Approach** (Freer & Fiene, 2023) is the applied model demonstrating how the CCEEHM complements, rather than replaces, existing systems. It is designed to draw data from and enhance licensing, Quality Rating and Improvement Systems (QRIS),

eBook
www.bookemon.com
rfiene@rikinstitute.com

accreditation, and professional development systems, unifying disparate data streams into a cohesive whole.

Grounded in this strong theoretical base, the CCEEHM moves from a conceptual framework to a tangible and innovative solution designed to transform how CCEE quality is measured and understood.

3.0 The Proposed Solution: The Child Care and Early Education Heart Monitor (CCEEHM)

The CCEEHM is the tangible solution to the measurement challenges outlined in this proposal. It is a comprehensive system designed to deliver a holistic, integrated view of program quality by combining structural and process indicators into a single, user-friendly platform. This section details the system's core components and demonstrates how they work in concert to provide a more nuanced and accurate assessment of early childhood education environments.

3.1 System Overview and Rationale

The "Heart Monitor" is more than a name; it is the central design philosophy. Our system is the first to measure the "heart" of quality—the rich, developmental interactions between educators and children—and embed those vital signs directly within the structural "body" of regulatory compliance. The CCEEHM exists as a software application (App) that integrates data from licensing compliance, QRIS, accreditation, and professional development systems to create a single, powerful monitoring tool.

3.2 Component 1: The Contact Hour (CH) Metric for Structural Quality

The CCEEHM replaces the traditional, static measurement of adult-child ratios and group sizes with the **Contact Hour (CH) metric**, a more effective, efficient, and dynamic measure of structural compliance. The CH metric is calculated by asking six key questions about a program's daily operations:

1. When does your first teaching staff arrive or when does your facility open?
2. When does your last teaching staff leave or when does your facility close?
3. What is the number of teaching/caregiving staff?
4. What is the number of children on your maximum enrollment day?
5. When does your last child arrive?

eBook www.bookemon.com
rfiene@rikinstitute.com

6. When does your first child leave?

The answers to these questions are used to construct a trapezoidal model representing the relationship between the number of children present, the number of staff available, and the hours of operation. Regulatory compliance is determined by comparing the program's calculated area within this model (representing actual contact) to a pre-determined ideal area (representing the regulatory standard). The shape of the model can vary (e.g., rectangle, square, triangle) based on the program's unique density distributions of child arrival and departure times.

3.3 Component 2: The Program Quality Indicators (PQI) for Process Quality

To capture the "heart" of quality, the CCEEHM incorporates the **Program Quality Indicators (PQIs)**, a set of 10 validated indicators that measure key aspects of process quality. These indicators, validated in studies from 2020-2024, provide the necessary depth to complement the structural data from the CH metric. The 10 PQIs cover a comprehensive range of domains, including staffing qualifications, curriculum, parental involvement, and key interactional observations, such as *how educators listen attentively when children speak* and *use language to develop reasoning skills*.

Each indicator is measured on a simple 1-4 ordinal scale, similar to those used in established accreditation and program quality assessment tools, making the data easy to interpret and score.

3.4 The Integrated Model: From Absolute to Relative Quality

The true innovation of the CCEEHM lies in its integration of the PQI data with the CH metric. This fusion fundamentally transforms the measurement of quality. The CH metric alone provides an **absolute value**—a clear determination of whether a program is in or out of compliance with structural standards. However, by layering the PQI data onto the CH model, the system moves to a more nuanced **relative value**.

This integrated approach no longer asks only, "Are there enough adults for the children present?" but also, "What is the quality of the interactions occurring during those contact hours?" This combined model provides a comprehensive, dynamic picture of both structural integrity and process excellence. In essence, the system moves from a simple pass/fail snapshot of structure to a dynamic motion picture of quality in action. Making

eBook www.bookemon.com
rfiene@rikinstitute.com

this level of detailed, continuous data collection and analysis feasible requires a significant technological leap forward.

4.0 Technological Innovation: AI-Powered Observation and Analysis

The integration of Artificial Intelligence (AI) is the enabling technology that makes the theoretical integration of structural and process quality, long a goal in the field, finally achievable at scale. This critical advancement overcomes the severe limitations of traditional methods and introduces a new level of rigor, objectivity, and efficiency. This technological maturity is precisely why this funding request is timely and viable.

The specific role of AI within the CCEEHM is to perform the intensive data collection required to unlock the system's full potential. The Contact Hour trapezoidal model provides the structural framework, but its true power is unlocked by populating it with thousands of data points on process quality—a task that is "not realistic" for human observers but is perfectly suited for trained AI. The CCEEHM leverages AI through the following mechanisms:

- AI observers will be trained to assess the Program Quality Indicators (PQIs) by analyzing video streams from cameras installed in classrooms. These AI observers can continuously and unobtrusively gather data on staff-child interactions, environmental quality, and curriculum implementation.
- AI will also be utilized to review digital staff records to efficiently determine credentials and qualifications for PQI 1, automating a time-consuming administrative task.

The use of AI for program monitoring offers distinct and transformative advantages:

- **Feasibility and Efficiency:** AI makes continuous, in-depth observation possible on a scale that would be cost-prohibitive and logistically impossible with human assessors, allowing for a complete daily picture rather than a brief snapshot.
- **Objectivity and Bias Reduction:** AI directly addresses and mitigates the known issues of human bias in regulatory compliance observing and decision-making. Once trained, an AI system applies assessment criteria consistently, without the subjective variability that can affect human judgment.
- **Reliability and Consistency:** AI observers achieve and maintain a high degree of certainty in scoring. Unlike human observers, who can experience "drift" in

eBook www.bookemon.com
rfiene@rikinstitute.com

inter-rater reliability over time, AI systems provide stable and consistent measurement, ensuring data is comparable across programs and jurisdictions.

This powerful technological capability is packaged within a user-friendly application designed for seamless implementation in the field.

5.0 Implementation and Feasibility: The CCEEHM Application

A powerful system is only effective if it is practical, accessible, and easy to use. The CCEEHM is designed for widespread adoption and is delivered through a straightforward and intuitive software application. This section demonstrates the project's feasibility by describing the user-friendly tool that brings this integrated monitoring system to life for professionals in the field.

The CCEEHM software application is designed with a simple opening screen that guides the user to two primary sections, computing results in real-time:

- **Contact Hour (CH) Calculator:** Users input a program's basic operational data—such as opening/closing times, staffing levels, and child attendance patterns. The App then automatically calculates the CH metric to assess structural quality.
- **Program Quality (PQI) Assessment:** This section guides users through the 10 validated indicators to evaluate process quality. The App manages all scoring automatically, calculating a final quality level based on the data entered and the age group selected.

The CCEEHM is designed for easy use by a diverse range of CCEE professionals, including program directors, licensing staff, quality assessors, and observers. By automating all complex calculations and scoring, the application removes the burden of manual analysis and ensures consistency in measurement. This focus on practical application makes the CCEEHM a highly cost-effective and efficient system for monitoring, making it a viable tool for jurisdictions seeking to improve their quality assurance systems.

eBook
www.bookemon.com
rfiene@rikinstitute.com

6.0 Expected Outcomes and Broader Impact

The successful development and implementation of the CCEEHM will produce significant, tangible outcomes that advance the field of Child Care and Early Education. By integrating structural and process quality measurement through an innovative, AI-powered system, this project will deliver a solution to one of the field's most persistent challenges.

The primary expected outcome of this project is a **fully functional, validated, and integrated program monitoring system**. The CCEEHM will provide a unified measure of structural and process quality, delivered through an accessible software application that is ready for deployment by state and local jurisdictions.

Beyond this primary deliverable, the broader impacts of this innovation will be substantial and transformative:

1. **Enhanced Monitoring Efficiency:** Jurisdictions will be equipped with a cost-effective and streamlined system that moves beyond traditional, separate, and labor-intensive inspection methods, allowing for more targeted and data-driven allocation of monitoring resources.
2. **Improved Data for Decision-Making:** The system will generate more reliable, objective, and holistic data on program quality, enabling administrators and policymakers to make better-informed decisions regarding technical assistance, professional development, and resource allocation to drive meaningful improvement.
3. **A Paradigm Shift in Quality Assessment:** The CCEEHM will establish a new, dynamic approach to measuring quality, shifting the focus from static compliance to a comprehensive understanding of children's daily experiences. This system truly captures the "heart" of early childhood education—the interactions between educators and children—within a robust structural framework, setting a new standard for how quality is defined and assessed.

The Child Care and Early Education Heart Monitor represents a pivotal step forward in our ability to measure, understand, and ultimately improve the quality of early learning experiences for all children. We formally request funding to realize this transformative vision and provide the CCEE field with the next generation of quality assurance tools.

eBook
www.bookemon.com
rfiene@rikinstitute.com

7.0 References

Fiene, R. (2019). A treatise on the theory of regulatory compliance. *Journal of Regulatory Science, 7*(1), 1-3. doi.org/10.21423/jrs-v07fiene.

Fiene, R. (2022). Regulatory compliance monitoring paradigms and the relationship of regulatory compliance/licensing with program quality: A policy commentary. *Journal of Regulatory Science 10*, 1–7.

Fiene, R. (2024). *Regulatory Compliance and Monitoring Systems*. Research Institute for Key Indicators and National Association for Regulatory Administration.

Fiene, R. (2025a). Potential Solution to the Child Care Trilemma Revisited: Finding the “Right Rules” - The Holy Grail of Early Care and Education. *Exchange*, Summer 2025, 64-66.

Fiene, R. (2025b). Finding the Rules that Work: An emerging paradigm promised to close the gap between regulatory compliance scores and quality of childcare services. *American Scientist, 113*, 16-21, (January-February 2025).

Fiene, R. (2025c). The Uncertainty–Certainty Matrix for Licensing Decision Making, Validation, Reliability, and Differential Monitoring Studies. *Knowledge, 5*(2), 8. https://doi.org/10.3390/knowledge5020008

Fiene, R., & Nixon, M. (1985). Instrument based program monitoring and the indicator checklist for child care. *Child Care Quarterly, 14*(3), 198-214.

Fiene, R. & Stevens, S. (2021). *Contact Hours as a New Metric Replacing Group Size and Staff-Child Ratios as well as a New Metric for COVID19 Thresholds*. Research Institute for Key Indicators/Penn State.

Freer, R. & Fiene, R. (2023). Regulatory Compliance and Quality Programs: Constraints and Opportunities for Integration. *Journal of Regulatory Science, 11*(1), 1-10. https://doi.org/10.21423/JRS.REGSCI.111264

Kontos, S. & Fiene, R. (1987). Child care quality, compliance with regulations, and children's development: The Pennsylvania Study. In D. A. Phillips (Ed.), *Quality in Child Care: What Does Research Tell Us?* (pp. 57-80). National Association for the Education of Young Children.

eBook www.bookemon.com

rfiene@rikinstitute.com

CCEE Heart Monitor: The Future of Quality Assurance in Early Education

1.0 Executive Summary: The Campaign's Core Concept

The Child Care and Early Education (CCEE) field has long operated with a fundamental disconnect: the systems used to monitor structural compliance—like health, safety, and staff-child ratios—are entirely separate from the tools used to assess process quality, the vital, human interactions that define a child's experience. This siloed approach is inefficient, creates an incomplete picture of program quality, and places an unnecessary burden on professionals. This campaign's strategic purpose is to introduce the CCEE Heart Monitor as the revolutionary, unified solution designed to simplify compliance, integrate quality measurement, and ultimately elevate the standard of care for every child.

1.1 The Big Idea: "Unifying Quality, Simplifying Compliance."

The CCEE Heart Monitor (CCEEHM) is not just another tool; it represents a paradigm shift in quality assurance. The central theme of this campaign is that for the first time, the foundational elements of **structural quality** and the nuanced dynamics of **process quality**—the true "heart" of care—are measured together in one integrated, user-friendly system. Drawing upon the proven Key Indicator Methodology (KIM), the CCEEHM provides a cohesive platform for staff, licensors, and quality assessors to gain a comprehensive and accurate understanding of a program's performance.

1.2 Target Audience Analysis

The CCEEHM is designed to address the specific pain points of key professionals across the early education landscape.

- **CCEE Licensors & Regulators:** They require a tool that delivers more accurate, efficient, and objective compliance monitoring. The CCEEHM provides a streamlined, data-driven system that moves beyond subjective assessments to deliver clear, reliable results.
- **Quality Assessors & Observers:** They demand a single, comprehensive tool that eliminates the complexity of using separate instruments. The CCEEHM automates

eBook
www.bookemon.com
rfiene@rikinstitute.com

scoring and reduces observational bias, allowing assessors to focus on meaningful evaluation rather than manual calculation.

- **CCEE Program Staff & Directors:** They need a clear roadmap to excellence that connects compliance to quality. The CCEEHM offers transparent metrics that link regulatory requirements directly to the qualitative aspects of their daily practice, providing actionable insights for improvement.

1.3 Campaign Tone and Voice

All campaign materials will adopt a **professional, innovative, and benefits-driven** tone. The voice will be clear and accessible, translating complex academic concepts like the "Contact Hour metric" and "Key Indicator Methodology" into tangible advantages for busy professionals. We will emphasize how this technology solves real-world problems, saves time, and empowers users with superior data.

This strategy establishes the "why" behind the CCEE Heart Monitor; the following section will detail the "how" through the core messages that bring this innovation to life.

2.0 Core Campaign Pillars: Key Messages & Proof Points

This section breaks down the CCEE Heart Monitor's value into four distinct and powerful messages. The strategic importance of these pillars is to provide clear, evidence-based reasons for adoption that directly address the pain points of our target audience, demonstrating how the CCEEHM is not just a better tool, but a better approach to quality assurance.

2.1 Pillar 1: One System, Total Quality: Unify Structural and Process Monitoring

The core innovation of the CCEEHM is its ability to uniquely combine the measurement of structural rules and process-based interactions into a single, cohesive system. For too long, the industry has treated these two critical components of quality as separate domains, measured with different tools by different people. The CCEEHM creates a unifying framework that recognizes that the "heart" of CCEE monitoring—the quality of adult-child interactions—is intrinsically linked to the structural foundation of health and safety.

eBook
www.bookemon.com
rfiene@rikinstitute.com

From Siloed to Seamless

Structural Quality (The Foundation)	Process Quality (The Heart)
The Old Challenge: Measuring the essential health and safety rules and regulations that protect children, including staff-child ratios and group size, using separate, often cumbersome compliance tools.	**The Old Challenge:** Assessing the dynamic, interpersonal "magic" that occurs in a classroom—the "dance" between an adult and child that fosters development—using different, subjective observational methods.
The Heart Monitor Solution: The system uses the **Contact Hour (CH) Metric**, an innovative and efficient method that requires answering just **6 simple questions** about staff and child attendance to accurately determine compliance with adult-child ratio and group size rules.	**The Heart Monitor Solution:** The system uses 10 validated **Program Quality Indicators (PQI)** to conduct a comprehensive observational assessment of curriculum, family engagement, and direct educator-child communication.

2.2 Pillar 2: Unmatched Efficiency and Cost-Effectiveness

The CCEE Heart Monitor was explicitly designed to be a cost-effective and efficient solution for a field with limited resources. Developed as a sophisticated yet easy-to-use software application (App), the system removes the burden of manual work for licensors and assessors. All complex calculations are handled automatically, freeing up professionals to focus on observation, support, and improvement.

- **Simplified Data Collection:** The revolutionary Contact Hour metric requires just **6 questions** to generate a powerful and accurate compliance score for adult-child ratios.
- **Automated Scoring:** The CCEEHM App performs all calculations instantly for both the Contact Hour metric and the 10 Program Quality Indicators, eliminating human error and saving valuable time.
- **Accessible Platform:** The entire system is available as a downloadable software application, putting powerful quality assurance technology directly into the hands of professionals.

eBook www.bookemon.com
rfiene@rikinstitute.com

2.3 Pillar 3: AI-Powered Objectivity and Accuracy

The CCEEHM leverages the power of Artificial Intelligence and video cameras to revolutionize classroom observation. Assessing process quality through the Program Quality Indicators requires thousands of observational data points, a task that is simply not feasible for human observers alone. AI makes comprehensive observation **doable**. This technology-driven approach provides two key advantages over traditional methods: it significantly reduces the potential for human observer bias, and it ensures greater certainty and less "drift" in reliability over time. By training AI observers, the system establishes a consistent and objective standard for quality measurement.

2.4 Pillar 4: Beyond Compliance: Unlock Actionable Insights for Program Excellence

The CCEEHM moves quality assurance beyond simple pass/fail compliance checks. It provides a nuanced, data-rich picture of program quality across multiple domains, enabling directors and staff to identify specific areas of strength and opportunities for growth. The 10 Program Quality Indicators deliver a detailed assessment that informs targeted professional development and drives meaningful improvement.

A 360-Degree View of Program Quality

- **Staffing & Environment:**
  - *Educator Qualifications:* Build a foundation of excellence by verifying the qualifications and expertise of your educational team.
  - *Stimulating Environment:* Create dynamic, child-led learning spaces where curiosity is sparked through accessible, meaningful materials and choices.
- **Curriculum & Child Development:**
  - *Developmentally Appropriate Curriculum:* Empower educators to deliver individualized learning experiences informed by ongoing child assessments.
  - *Encouraging Communication:* Foster rich, back-and-forth conversations that expand children's language and self-expression.
  - *Developing Reasoning Skills:* Guide children in becoming critical thinkers by using language and materials to promote problem-solving and logic.
- **Family Partnership:**
  - *Staff & Family Opportunities:* Build a strong community by fostering authentic, two-way communication and trusting relationships with families.

eBook
www.bookemon.com
rfiene@rikinstitute.com

    - *Information on Child's Progress:* Ensure families are true partners in their child's journey with regular, formal updates on developmental progress.
- **Direct Interaction Quality:**
    - *Infant/Toddler Observation:* Nurture the development of our youngest learners by focusing on the quality and frequency of responsive, turn-taking conversations.
    - *Attentive Listening:* Guarantee every child feels seen and heard by ensuring educators provide their full, undivided attention.
    - *Warm Speech:* Cultivate a safe and supportive atmosphere by observing and encouraging the use of a caring voice and positive body language in every interaction.

By translating complex observations into clear, actionable data, the CCEE Heart Monitor equips every program with a roadmap for excellence. These powerful messages lead directly to our call for a new standard in the field.

3.0 Call to Action & Vision for the Future

This final section outlines the campaign's central "ask." The goal is to compel every CCEE professional—from state-level regulators to classroom educators—to take the next step and embrace a new, more effective standard for quality assurance in early childhood education.

3.1 The Invitation

We invite you to experience the future of integrated program monitoring. Visit the CCEE Heart Monitor application to explore the data collection tools, see how the automated scoring works, and understand firsthand how this system unifies structural and process quality. At the link, you can:

- Interact with the **Contact Hour (CH) Calculator** to see how simple inputs generate a precise compliance metric.
- Review the 10 **Program Quality Indicators (PQI)** and the automated assessment tool.
- Familiarize yourself with the key data elements and scoring system that power this innovative approach.

Explore the CCEE Heart Monitor here: https://www.cceeheartmonitor.com/demo

eBook
www.bookemon.com
rfiene@rikinstitute.com

3.2 Our Vision: A New Era for Child Care Quality

The CCEE Heart Monitor is more than an application; it is our vision for the future of early education. By providing a cost-effective, efficient, and deeply integrated monitoring system, we empower every CCEE professional to move beyond the checklist of compliance and focus on what truly matters: fostering the high-quality interactions that form the heart of early childhood development. Together, we will unify our standards, simplify our processes, and build a stronger, more equitable foundation for every child.

eBook
www.bookemon.com
rfiene@rikinstitute.com

A New Paradigm for Early Childhood Program Monitoring: The Case for Adopting the CCEE Heart Monitor System

1. The Challenge: Fragmented Quality Monitoring in Early Childhood Education

Effective program monitoring is the cornerstone of any system designed to ensure child safety, well-being, and positive developmental outcomes in early care and education settings. The strategic goal of monitoring is to provide a clear, accurate, and comprehensive picture of a program's quality. However, the prevailing approach to oversight in the Child Care and Early Education (CCEE) field is fundamentally fragmented, hindering this goal.

Currently, the assessment of program quality is bifurcated. **Structural quality**—which includes foundational health and safety regulations, staff-child ratios, and group sizes—is measured separately from **process quality**, which encompasses the direct, developmental interactions between educators and children. This separation creates systemic inefficiencies, as different personnel, such as licensing inspectors and quality observers, use "separate and distinct tools" to evaluate these disconnected components. This duplicative and uncoordinated approach produces an incomplete picture of program quality, consumes valuable resources, and fails to capture the dynamic interplay between a program's structure and the daily experiences of children. To overcome these limitations, the field urgently needs a unified, integrated approach to monitoring.

2. The Solution: The Child Care and Early Education Heart Monitor (CCEEHM)

The Child Care and Early Education Heart Monitor (CCEEHM) is a groundbreaking system designed to resolve the challenge of fragmented oversight. Positioned as an evidence-based innovation for modernizing program monitoring, the CCEEHM is a "new Integrated Program Monitoring System Approach" that assesses both structural and process quality within a single, unified software platform.

eBook
www.bookemon.com
rfiene@rikinstitute.com

This system is built upon established and proven methodologies, including the Key Indicator Methodology (KIM)—a research-validated approach that identifies the most powerful and predictive indicators of overall quality, allowing for more targeted and efficient monitoring. The CCEEHM is delivered as a user-friendly software application (App) that simplifies data collection for licensors, assessors, and program staff by automating scoring and consolidating information. Its transformative power is derived from two core, interconnected components that work in concert to provide a holistic view of program quality: the **Contact Hour (CH)** metric and the **Program Quality Indicators (PQI)**.

3. Re-engineering Structural Quality: The Contact Hour (CH) Metric

For decades, structural quality has been measured using static, snapshot-in-time observations of adult-child ratios and group sizes. These measurements fail to capture the reality of a full day of program operation, where children and staff arrive and depart at different times. From a regulatory perspective, this is a critical flaw, as momentary compliance can mask periods of significant risk. The strategic importance of adopting a more dynamic metric that reflects real-world program operations—and the associated risks—cannot be overstated.

The Contact Hour (CH) metric offers a more effective and efficient method for measuring compliance. Its methodology is simple, requiring answers to just six questions regarding staff and child arrival and departure times. The primary benefit of the CH metric is its ability to transform the static, one-dimensional concepts of Adult-Child Ratio (ACR) and Group Size (GS) into a dynamic, two-dimensional measure by integrating the critical element of **time**. This provides a far more accurate assessment of children's "exposure time" to different group densities, enabling regulators to identify potential overpopulation and other systemic risks that a single snapshot could never reveal.

The advantages of the CH metric include:

- **Greater Accuracy:** It moves beyond simple headcounts taken at one moment to provide a nuanced understanding of compliance throughout the entire day, revealing patterns of risk.
- **Identifies Risk:** It effectively determines when a facility is "overpopulated" or "out of compliance" with ratio standards by analyzing the relationship between the number of staff, children, and the duration of their time in care.
- **Provides a Foundational Score:** It creates a robust, quantitative baseline for structural quality upon which the crucial elements of process quality can be layered.

eBook
www.bookemon.com
rfiene@rikinstitute.com

By providing a more accurate foundation for structural compliance, the CH metric sets the stage for a truly integrated assessment that incorporates the human elements of care.

4. Capturing the "Heart" of Quality: The Program Quality Indicators (PQI)

While structural rules are vital for ensuring health and safety, the interactions between staff and children represent the "heart" of quality. This is where the "magic" of development occurs—the so-called "dance" between the adult and the child. A revolutionary monitoring system must not only acknowledge this but place the measurement of these interactions at its center.

The Program Quality Indicators (PQI) are a validated set of 10 key indicators that measure the essential elements of process quality. These indicators are not arbitrary; they were drawn from decades of key indicator studies and scientifically validated in a recent study from Saskatchewan, ensuring their relevance and reliability. The 10 PQIs provide a comprehensive assessment across the core domains of high-quality early childhood education.

PQI Domain	Focus Area
Staffing & Professionalism	Educator qualifications and credentials.
Learning Environment & Curriculum	Creation of a stimulating, child-centered environment with a developmentally appropriate and individualized curriculum based on ongoing child assessments.
Family Partnership & Communication	Opportunities for staff-family engagement and formal mechanisms for reporting on child progress.
Educator-Child Interactions	Observational measures of communication, attentive listening, warmth, and the use of language to develop reasoning skills, focusing on both verbal and non-verbal cues to foster cognitive and emotional growth.

eBook
www.bookemon.com
rfiene@rikinstitute.com

The CCEEHM's true innovation lies in how it integrates this data. The system layers the scaled, observational data of the PQIs onto the quantitative, time-based foundation of the CH metric. This fusion is what transforms a simple pass/fail "absolute value" of structural compliance into a nuanced "relative value" that reflects the richness of a child's actual daily experience. This provides policymakers with a complete and meaningful picture of a program's quality.

5. Policy Implications and Benefits for State Agencies

For regulatory bodies to be truly effective, they must evolve beyond simple compliance enforcement to become active promoters of program quality. Adopting an advanced, integrated tool like the CCEEHM is a strategic step in this evolution, offering significant benefits for state licensing and policymaking bodies.

1. **Unified and Holistic Oversight:** CCEEHM provides a single, comprehensive picture of both structural and process quality. This eliminates the blind spots and information silos created by separate, unlinked monitoring systems, allowing for a more accurate understanding of a program's overall performance.
2. **Increased Efficiency and Cost-Effectiveness:** A single, App-based system streamlines the entire monitoring process. It reduces duplicative efforts by different types of assessors and automates scoring, which saves significant time and administrative resources that can be redirected toward quality improvement activities.
3. **Data-Driven Policy and Support:** The integrated data generated by CCEEHM provides a powerful evidence base for decision-making. Agencies can more effectively target technical assistance, allocate professional development resources, and design quality improvement initiatives based on a complete understanding of program strengths and needs.
4. **Focus on What Matters Most:** By integrating process quality directly into the compliance framework, the system finally measures the **heart** of early learning. This incentivizes and supports the educator-child interactions that are most critical for positive child development, aligning regulatory focus with best practices.
5. **Enhanced Objectivity and Reliability:** The CCEEHM framework is designed for the future, with the potential to integrate Artificial Intelligence (AI) to conduct PQI observations. This would reduce the impact of human bias and observer drift, leading to greater certainty and consistency in regulatory decision-making.

eBook
www.bookemon.com
rfiene@rikinstitute.com

By leveraging these benefits, state agencies can transform their monitoring systems from a checklist-based exercise into a powerful engine for continuous quality improvement.

6. A Call to Action: Adopting an Integrated Future for CCEE Monitoring

The prevailing fragmented monitoring systems in early care and education are no longer sufficient to meet the needs of children, families, or providers. These outdated approaches are inefficient, incomplete, and fail to prioritize the interactions that matter most for child development. The Child Care and Early Education Heart Monitor system offers a scientifically grounded, efficient, and demonstrably superior alternative.

Therefore, this brief puts forth a clear policy recommendation: **State licensing agencies and early childhood policymakers should actively explore, pilot, and move toward the adoption of the Child Care and Early Education Heart Monitor (CCEEHM) to modernize their quality assurance systems.**

By embracing this integrated future, we can move beyond mere compliance and build a monitoring framework that truly supports and promotes excellence. Adopting such a system will have a profound and lasting impact on our collective ability to ensure every child has access to the safe, supportive, and high-quality early learning experiences they need to thrive.

eBook
www.bookemon.com
rfiene@rikinstitute.com

CCEE Heart Monitor: A Comprehensive Implementation Guide for Administrators and Licensing Bodies

1.0 Introduction: Unifying the Measurement of Child Care Quality

For decades, a significant challenge in the Child Care and Early Education (CCEE) field has been the separate measurement of structural quality—the foundational health and safety regulations—and process quality—the dynamic, developmental interactions between staff and children. The Child Care and Early Education Heart Monitor (CCEEHM) introduces a novel, integrated solution to this long-standing issue. The strategic importance of this system lies in its ability to combine the rigor of regulatory compliance with the qualitative "heart" of quality into a single, unified monitoring platform.

This guide serves as a practical, step-by-step manual for child care administrators and licensing bodies seeking to adopt and utilize the CCEEHM. It provides a clear pathway for implementation, ensuring that users can effectively leverage the system to gain a holistic view of program quality in a manner that is both cost-effective and efficient.

This implementation guide will cover the core components of the CCEEHM system:

- The **Contact Hour (CH)** metric for assessing structural quality.
- The **Program Quality Indicators (PQI)** for assessing process quality.
- The **CCEEHM Application** for data entry and scoring.

We will begin by exploring the theoretical foundations of the system, which are essential for its successful application.

eBook
www.bookemon.com
rfiene@rikinstitute.com

2.0 The Core Concepts: Understanding the CCEEHM Framework

A solid understanding of the CCEEHM's theoretical framework is essential for its effective implementation. This system is more than just a new set of tools; it provides a unified lens through which to view both the foundational safety structures and the dynamic, developmental interactions that define a high-quality early childhood program. By merging these two domains, the CCEEHM offers a more complete and nuanced picture of performance.

Bridging Structural and Process Quality

Traditionally, the CCEE field has measured quality in two distinct categories. **Structural Quality** refers to the tangible, regulated aspects of a program, such as staff-child ratios, group size, and other health and safety rules. **Process Quality**, conversely, captures the intangible "heart" of a program—the quality of interactions between staff and children where the "magic occurs." These two areas have historically been assessed with separate and distinct tools. The CCEEHM is designed to merge these two categories into a single, integrated monitoring system, placing the measurement of process quality squarely within the structural measurement strategy.

The Contact Hour (CH) Metric: A New Paradigm for Structural Quality

The **Contact Hour (CH)** metric is a more effective and efficient method for measuring compliance with adult-child ratios and group sizes. It moves beyond static numbers, which provide only a snapshot in time, to create a dynamic picture of staff-child contact over the course of an entire day. By analyzing the relationship between when children arrive and leave, how long the facility is open, and how many staff are present, the CH metric offers a more accurate and meaningful assessment of regulatory compliance.

Program Quality Indicators (PQI): Measuring the Heart of the Program

The **Program Quality Indicators (PQI)** are a set of validated indicators drawn from decades of key indicator studies. They are designed to measure the essential process quality elements within a program, such as staffing qualifications, curriculum, family involvement, and educator-child interactions. When combined with the CH metric, the PQIs add a crucial layer of qualitative data. This integration shifts the final measurement

eBook
www.bookemon.com
rfiene@rikinstitute.com

from a simple, absolute value (e.g., in or out of compliance) to a more nuanced, relative value that reflects the true quality of the program's environment.

This section has outlined the conceptual framework. We will now proceed to the practical steps required to collect data for the Contact Hour metric.

3.0 Step-by-Step Implementation: The Contact Hour (CH) Metric

This section outlines the practical steps involved in calculating the Contact Hour (CH) metric. We will provide the specific questions needed for data collection and the conceptual models used for interpretation. It is important to note that while the concepts are explained here for your understanding, the CCEEHM application performs all final calculations automatically.

3.1 Data Collection: The Six Core Questions

To begin, you must collect data by asking the following six questions for each distinct classroom or well-defined group within the program.

1. When does your first teaching staff arrive or when does your facility open (TO1)?
2. When does your last teaching staff leave or when does your facility close (TO2)?
3. Number of teaching/caregiving staff (TA)?
4. Number of children on your maximum enrollment day (NC)?
5. When does your last child arrive (TH1)?
6. When does your first child leave (TH2)?

3.2 Interpreting the Data: The Trapezoidal Model and Density

The answers to the six core questions are used to build a model that visualizes the density of children and staff over the course of a day. As described in the "Contact Hour Diagram Paradigm and Schematic (Figure 1)," the number of children and staff present over time creates a shape, which is often a trapezoid but can also be a rectangle or triangle depending on arrival and departure patterns.

The shape of this distribution has direct implications for regulatory compliance. The five possible density displays are outlined below:

eBook
www.bookemon.com
rfiene@rikinstitute.com

- **A Triangular Distribution:** This represents a scenario where the last child arrives at the same time the first child is leaving. This results in the lowest number of Contact Hours and is very unlikely to occur, but it is theoretically possible.
- **A Trapezoidal Distribution:** This is the most likely scenario. It reflects children gradually arriving and gradually leaving, creating a period of full enrollment between the two slopes of the trapezoid.
- **A Rectangular Distribution:** This scenario, where all children arrive and leave at the same time, is unlikely but serves as the *reference point* for the CH metric because it represents the most efficient model where all contact hours are covered.
- **An Extended Distribution:** A distribution that is wider than the rectangular reference indicates that the facility is open for an extended period. While not necessarily out of compliance with ratios, it signifies a higher number of total Contact Hours and could be a factor when considering the potential for exposure to infectious diseases.
- **An Over-Capacity Distribution:** A distribution that is taller than the rectangular reference clearly indicates a very high CH and non-compliance with Adult-Child Ratio (ACR) and Group Size (GS) regulations. The CH methodology was designed specifically to identify these levels of non-compliance.

3.3 Determining Compliance

The ultimate goal of the CH metric is to determine regulatory compliance. This is achieved by comparing the program's actual **Relatively Weighted Contact Hours (RWCH)**, which the CCEEHM app calculates, against the reference values in the **Contact Hour (CH) Conversion Table (Table 1)**.

The rule is straightforward: **If a program's calculated RWCH exceeds the value in the table for its number of children (NC) and required ratio, it is considered out of compliance with ACR standards.**

It is crucial to understand the assumptions behind the reference table. The values in the table represent a "perfectly efficient" scenario: an 8-hour day where full enrollment is present for the entire 8 hours. While this is unlikely to occur in practice, it provides a standardized, best-case baseline. Real-world programs with dynamic schedules are compared against this efficient model to determine if their staff and child density falls within compliant boundaries.

Having detailed the measurement of the structural component, we now turn to assessing the process quality component through the Program Quality Indicators.

eBook www.bookemon.com
rfiene@rikinstitute.com

4.0 Step-by-Step Implementation: The Program Quality Indicators (PQI)

This section details the 10 Program Quality Indicators (PQI) used to measure the process quality of a CCEE program. These indicators assess key aspects of the program environment, including staffing, curriculum, family engagement, and educator-child interactions. Successful implementation requires careful document review and classroom observation, as outlined for each indicator below.

4.1 PQI 1: Number of ECE III Educators

- **Indicator Definition:** This indicator measures the percentage of teaching staff who hold an ECE III (AA and BA Level) credential. The purpose is to quantify the level of advanced formal education within the program's teaching staff.
- **How to Measure:**
    - Access the program's Staff Information Summary form.
    - Under "Certification," locate "Certification Date" and "Certification Level (Highest ECE Level Certified)."
    - Record the number of ECE III certified staff working at least 65 hours per month.
    - Record the total number of teaching staff working at least 65 hours per month.
- **Scoring:**
    - Divide the number of ECE III staff by the total number of teaching staff and multiply by 100 to get a percentage.
    - Assign a score of 1-4 based on the resulting percentage:
        - **1:** 0% to 25%
        - **2:** 26% to 50%
        - **3:** 51% to 75%
        - **4:** 76% to 100%

4.2 PQI 2: Stimulating and Dynamic Environment

- **Indicator Definition:** This indicator assesses whether the program is child-centered, allows children to access materials independently, provides meaningful choices, and reflects children's interests and projects in the learning environment, drawing from criteria in *Play and Exploration Guides*.

eBook
www.bookemon.com
rfiene@rikinstitute.com

- **How to Measure:**
    - Observe the classroom and review the program plan to determine if the following 11 items are present. Record "Y" for yes or "N" for no for each item.
        - Co-teaching is evident. (Y/N)
        - Children are viewed as competent learners & can access materials independently. (Y/N)
        - Authentic and meaningful materials are used with children. (Y/N)
        - Children are provided with meaningful choices. (Y/N)
        - Children's work, art and photos are displayed respectfully. (Y/N)
        - Family photos are displayed in the early learning program. (Y/N)
        - Documentation of learning is displayed and discusses holistic development. (Y/N)
        - Environment reflects the culture and beliefs of the children, families and staff. (Y/N)
        - Variety of books & other print materials are available throughout the classroom. (Y/N)
        - A variety of writing materials are accessible to children most of the time. (Y/N)
        - There is evidence of the children's interests & projects in the classroom. (Y/N)
- **Scoring:**
    - Count the total number of "Y" responses.
    - Divide the number of "Y"s by 11 and multiply by 100 to get a percentage.
    - Assign a score of 1-4 based on the resulting percentage:
        - **1:** 0% to 25%
        - **2:** 26% to 50%
        - **3:** 51% to 75%
        - **4:** 76% to 100%

4.3 PQI 3: Developmentally Appropriate Curriculum Based on Assessments of Each Child

- **Indicator Definition:** This indicator verifies that the program uses an individualized planning document for its curriculum, informed by the developmental assessments of each child. The assessment should show a clear link between each child's assessment, emergent curriculum practices, and documented learning activities.
- **How to Measure:**

eBook www.bookemon.com
rfiene@rikinstitute.com

    - Select a random sample of 10 individual children's records (these can be formal portfolios or informal anecdotal records).
    - Create a checklist for the 10 children. For *each child's record*, you must verify the presence of three key elements. Record "Y" (Yes) or "N" (No) for each element for each child.
    - The three key elements to verify for each child are:
        - **Element 1:** The program practices emergent curriculum, allowing the interests of the children to determine learning content, informed by individual developmental assessments. (Y/N)
        - **Element 2:** The children and educators are co-learners in the exploration of projects. (Y/N)
        - **Element 3:** Learning activities are documented, displayed in the learning environment, and used to plan further learning activities. (Y/N)
    - A child's record receives an overall "Y" only if all three key elements above are marked "Y".
- **Scoring:**
    - Count the total number of children's records that received an overall "Y."
    - Divide this number by 10 and multiply by 100 to get a percentage.
    - Assign a score of 1-4 based on the resulting percentage:
        - **1:** 0% to 25%
        - **2:** 26% to 50%
        - **3:** 51% to 75%
        - **4:** 76% to 100%

4.4 PQI 4: Opportunities for Staff and Families to Get to Know Each Other

- **Indicator Definition:** This indicator assesses whether the program provides opportunities for staff and families to interact and engage in ongoing, two-way communication that is respectful of each family's strengths, choices, and goals.
- **How to Measure:**
    - Review program policies and interview staff to determine if the following three examples are present. Record "Y" for yes or "N" for no for each item.
        - The program provides communication, education, and informational materials & opportunities for families that are delivered in a way that meets their diverse needs. (Y/N)

eBook
www.bookemon.com
rfiene@rikinstitute.com

        - The program communicates with families using different modes of communication, and at least one mode promotes two-way communication. (Y/N)
        - The program demonstrates respect and engages in ongoing two-way communication. The program respects each family's strengths, choices, & goals for their children. (Y/N)
- **Scoring:**
    - Count the total number of "Y" responses (range is 0-3).
    - Divide the number of "Y"s by 3 and multiply by 100 to get a percentage.
    - Assign a score of 1-4 based on the resulting percentage:
        - **1:** 0% to 25%
        - **2:** 26% to 50%
        - **3:** 51% to 75%
        - **4:** 76% to 100%

4.5 PQI 5: Families Receive Information on Their Child's Progress Regularly Using a Formal Mechanism

- **Indicator Definition:** This indicator measures whether families receive formal, regular updates on their child's developmental progress, based on assessments, and whether these interactions are conducted in a culturally and linguistically appropriate manner.
- **How to Measure:**
    - Review program records and interview staff to score the following items. Follow the conditional logic carefully.
        - First, determine if the program holds regularly scheduled (at least 2x/year) parent conferences to discuss developmental progress **AND** provides families with a report.
        - **If YES** to both conditions in item #1, score 3 points and proceed directly to item #4.
        - **If NO** to the combined conditions in item #1, proceed to items #2 and #3:
            - Does the program hold regularly scheduled (at least 2x/year) conferences but does **NOT** provide a report? (If yes, score 2 points).
            - Does the program **NOT** hold regularly scheduled conferences but **DOES** provide families with a report? (If yes, score 1 point).

eBook
www.bookemon.com
rfiene@rikinstitute.com

        - Finally, determine if all interactions are done in a culturally and linguistically appropriate way. (If yes, score 1 point).
- **Scoring:**
    - Add the total points from the items above. The total score will range from 0 to 4. A score of 4 is only possible if the program meets the criteria for item #1 and item #4.

4.6 PQI 6: Educators Encourage Children to Communicate (Preschool Class)

- **Indicator Definition:** This indicator assesses whether educators actively encourage back-and-forth communication with children. This includes using materials like puppets and props, expanding on children's conversations, and providing opportunities for children to describe their feelings and activities.
- **How to Measure:**
    - Observe a preschool classroom for a minimum of 15 minutes. Determine which of the following score levels the classroom best fits by verifying if all criteria for that level are met.
    - **Score 1:**
        - No activities are used by staff with children to encourage them to communicate (e.g., no talking about drawings, dictating stories, sharing ideas, finger plays, songs). (Y/N)
        - Very few materials that encourage communication are accessible. (Y/N)
    - **Score 2:**
        - Some activities are used by staff with children to encourage them to communicate. (Y/N)
        - Some materials are accessible to encourage children to communicate. (Y/N)
        - Communication activities are generally appropriate for the children in the group. (Y/N)
    - **Score 3:**
        - Communication activities take place during both free play and group times (e.g., child dictates story about painting; small group discusses trip to store). (Y/N)
        - Materials that encourage communication are accessible in a variety of interest centers (e.g., small figures in block area; puppets in book area; dramatic play props). (Y/N)

eBook www.bookemon.com
rfiene@rikinstitute.com

- **Score 4:**
  - Staff balance listening and talking appropriately for the age and abilities of children during communication activities (e.g., leave time for children to respond). (Y/N)
  - Staff link children's spoken communication with written language (e.g., write down what children dictate and read it back to them). (Y/N)

- **Scoring:**
  - Determine the final score (1, 2, 3, or 4) by identifying the highest level for which the classroom meets *all* the listed criteria. A partial credit score (e.g., "2+") can be awarded if the classroom fully meets the criteria for one level and partially meets the criteria for the next highest level.

4.7 PQI 7: Infant Toddler Observation (if applicable)

- **Indicator Definition: Note:** This indicator applies only to programs with an infant/toddler classroom. If none is present, mark this indicator as N/A and proceed to PQI 8. This indicator measures the quality of verbal and nonverbal communication between educators and infants/toddlers. It assesses whether staff initiate turn-taking conversations, respond to nonverbal cues, and ask age-appropriate questions.
- **How to Measure:**
  - Observe an infant/toddler classroom for a minimum of 15 minutes. Determine which of the following score levels the classroom best fits by verifying if all criteria for that level are met.
  - **Score 1:**
    - Staff never initiate turn-taking conversations with children (e.g., rarely encourage baby to babble back). (Y/N)
    - Staff questions are often not appropriate for children, or no questions are asked. (Y/N)
    - Staff respond negatively when children can't answer questions (e.g., "You should know this"). (Y/N)
  - **Score 2:**
    - Staff sometimes initiate conversations with children (e.g., babble back and forth with baby; short interactions with toddlers). (Y/N)
    - Staff sometimes ask children appropriate questions and wait for the child to respond. (Y/N)
    - Staff respond neutrally or positively to children who can't answer questions. (Y/N)

eBook www.bookemon.com
rfiene@rikinstitute.com

    - **Score 3:**
        - Staff initiate engaging conversations with children throughout the observation. (Y/N)
        - Staff often personalize questions and/or conversations for individual children. (Y/N)
        - Staff often pay attention to children's questions (verbal or nonverbal) and answer in a satisfying manner. (Y/N)
        - Staff ask questions in which children show interest in answering. (Y/N)
    - **Score 4:**
        - Staff frequently have turn-taking conversations with children throughout the observations. Many appropriate questions are used during both play and routines. (Y/N)
        - Staff ask children appropriate questions, wait a reasonable time for a response, and then answer if needed (e.g., "Where's the ball? … There it is!"). (Y/N)
- **Scoring:**
    - Determine the final score (1, 2, 3, or 4) by identifying the highest level for which the classroom meets *all* the listed criteria. A partial credit score (e.g., "2+") can be awarded if the classroom fully meets the criteria for one level and partially meets the criteria for the next highest level.

4.8 PQI 8: Educators Use Language to Develop Reasoning Skills (Preschool)

- **Indicator Definition:** This indicator assesses whether educators use language to help children understand logical relationships such as same/different, sequencing, and cause and effect. This involves using materials that stimulate reasoning and encouraging children to explain their thought processes.
- **How to Measure:**
    - Observe a preschool classroom for a minimum of 15 minutes. Determine which of the following score levels the classroom best fits by verifying if all criteria for that level are met.
    - **Score 1:**
        - Staff do not talk with children about logical relationships (e.g., ignore questions about why things happen). (Y/N)
        - Concepts are introduced inappropriately (e.g., too difficult, worksheets without concrete experiences). (Y/N)

eBook www.bookemon.com
rfiene@rikinstitute.com

- **Score 2:**
  - Staff sometimes talk about logical relationships or concepts (e.g., explain that outside time comes after snacks). (Y/N)
  - Some concepts are introduced appropriately for the ages and abilities of children, using words and experiences. (Y/N)
- **Score 3:**
  - Staff talk about logical relationships while children play with materials that stimulate reasoning (e.g., sequence cards, sorting games). (Y/N)
  - Children are encouraged to talk through or explain their reasoning when solving problems. (Y/N)
- **Score 4:**
  - Staff encourage children to reason throughout the day, using actual events and experiences as a basis for concept development. (Y/N)
  - Concepts are introduced based upon children's interests or needs to solve problems (e.g., talk children through balancing a tall block building). (Y/N)

- **Scoring:**
  - Determine the final score (1, 2, 3, or 4) by identifying the highest level for which the classroom meets *all* the listed criteria. A partial credit score (e.g., "2+") can be awarded if the classroom fully meets the criteria for one level and partially meets the criteria for the next highest level.

4.9 PQI 9: Educators Listen Attentively When Children Speak

- **Indicator Definition:** This indicator focuses on whether educators give children their undivided attention when they are speaking. This includes being at the child's eye level, making eye contact, nodding, and rephrasing comments to show engagement.
- **How to Measure:**
  - Conduct 10 separate, 2-minute observations of interactions throughout the observation period.
  - For each 2-minute block, rate the educators' attentiveness on the following 4-point Likert scale:
    - **1:** Never / Not at All
    - **2:** Somewhat / Few Instances
    - **3:** Quite a Bit / Many Instances
    - **4:** Very Much / Consistently

eBook www.bookemon.com
rfiene@rikinstitute.com

    - Record the score (1-4) for each of the 10 observation periods.
- **Scoring:**
    - Add the 10 scores together (total will range from 10-40).
    - Divide the total score by 10 to get an average.
    - Round the average to the nearest whole number (e.g., 3.7 rounds to 4; 2.2 rounds to 2) to get the final score of 1, 2, 3, or 4.

4.10 PQI 10: Educators Speak Warmly to Children

- **Indicator Definition:** This indicator assesses the emotional tone of educator-child communication. Educators should consistently use a caring voice and positive body language, avoiding harsh language or commands, and making each child feel valued.
- **How to Measure:**
    - Conduct 10 separate, 2-minute observations of interactions throughout the observation period.
    - For each 2-minute block, rate the warmth of educators' speech on the following 4-point Likert scale:
        - **1:** Never / Not at All
        - **2:** Somewhat / Few Instances
        - **3:** Quite a Bit / Many Instances
        - **4:** Very Much / Consistently
    - Record the score (1-4) for each of the 10 observation periods.
- **Scoring:**
    - Add the 10 scores together (total will range from 10-40).
    - Divide the total score by 10 to get an average.
    - Round the average to the nearest whole number (e.g., 3.7 rounds to 4; 2.2 rounds to 2) to get the final score of 1, 2, 3, or 4.

Now that we have covered the data collection for both the CH and PQI components, the next section will explain how to input this data into the CCEEHM application.

5.0 Using the CCEE Heart Monitor Application

The CCEE Heart Monitor (CCEEHM) Application is the digital tool that streamlines the entire monitoring process. Its primary function is to perform all the complex calculations for both the Contact Hour (CH) metric and the Program Quality Indicators (PQI)

eBook
www.bookemon.com
rfiene@rikinstitute.com

assessment, providing you with real-time results and eliminating the need for manual scoring. The application's opening screen has two main sections accessible via tabs.

5.1 Contact Hour (CH) Calculator Tab

In this section of the application, you will input the data collected from the six core questions detailed in Section 3.1 of this guide. Once you have entered the operational data (staff and child arrival/departure times, number of staff, number of children), the application will automatically compute the CH metric and determine the program's compliance status with adult-child ratio and group size standards.

5.2 Program Quality (PQI) Assessment Tab

In this section, you will enter the final scores you determined for each of the 10 Program Quality Indicators, as outlined in Section 4.0. After you input the scores and select the appropriate age group (e.g., Preschool, Infant-Toddler), the application will automatically score each indicator and generate a final quality level for the program.

With the data entered, the application generates an integrated result, which we will now explore how to interpret.

6.0 Interpreting the Final Results and Determining Quality Levels

The final, integrated score produced by the CCEEHM application represents the powerful intersection of structural and process quality. This score is not merely a compliance check or a qualitative rating; it is a holistic and nuanced view of the program's overall performance. It combines the foundational safety and supervision metrics with the critical elements of interaction and curriculum, providing a comprehensive understanding of the program's heart and structure in a single, unified result.

The application assigns one of four quality levels based on the total standardized score from the PQI assessment. The scoring protocol varies depending on the age group being assessed.

Quality Level	Age Group	Standardized Score Range

eBook www.bookemon.com
rfiene@rikinstitute.com

High Quality	Mixed Age	36+
	Preschool	32+
	Infant-Toddler	28+
High-Mid Quality	Mixed Age	30–35
	Preschool	26–31
	Infant-Toddler	22–27
Mid-Low Quality	Mixed Age	20–29
	Preschool	16–25
	Infant-Toddler	12–21
Low Quality	Mixed Age	19 or less
	Preschool	15 or less
	Infant-Toddler	11 or less

By following this guide and utilizing the accompanying CCEE Heart Monitor application, child care administrators and licensing bodies can successfully implement a cost-effective, efficient, and research-backed monitoring system. This integrated approach moves beyond traditional measurement methods to truly get at the "heart" of early childhood education quality, providing a clear and comprehensive picture that can be used to drive meaningful improvement.

eBook
www.bookemon.com
rfiene@rikinstitute.com

Case Study 1: Assessing the "Little Sprouts Early Learning Center" with the CCEE Heart Monitor

Introduction: A New Lens on Child Care Quality

In the field of Child Care and Early Education (CCEE), assessing program quality has traditionally been a divided effort. On one hand, we have **structural quality**—the measurable, foundational elements like health and safety regulations, group sizes, and staff-to-child ratios. On the other, we have **process quality**—the dynamic, human interactions between educators and children that form the true "heart" of learning and development. These two aspects have almost always been measured with separate tools, by different people, at different times, making it difficult to get a single, holistic view of a program.

The **Child Care and Early Education Heart Monitor (CCEEHM)** is an innovative, integrated system designed to solve this very problem. It combines the measurement of both structural and process quality into a single, efficient assessment. This case study provides a practical, step-by-step walkthrough of how the CCEEHM is used to evaluate a fictional program, the "Little Sprouts Early Learning Center," making the system's abstract concepts easy to understand.

1. Meet "Little Sprouts": Our Fictional Early Learning Center

The "Little Sprouts Early Learning Center" is a community-based program dedicated to providing a nurturing environment for young children. The center operates two classrooms: a bustling preschool room for children aged 3-5 and a cozy infant-toddler room for children under 3. This setup allows us to demonstrate how the CCEEHM system applies its full range of indicators across different age groups. Today, a quality assessor is visiting "Little Sprouts" to conduct a full evaluation using the CCEEHM App.

The assessor's first step is to evaluate the program's structural quality using the CCEEHM's foundational metric: the Contact Hour.

eBook
www.bookemon.com
rfiene@rikinstitute.com

2. Part I: Assessing Structural Quality with the Contact Hour (CH) Metric

Traditional compliance with adult-child ratios is often a static snapshot, confirming that a program meets the standard at a single moment in time. The **Contact Hour (CH)** metric transforms this into a dynamic measurement. By incorporating the dimension of time—how long children are present and how many staff are available throughout the day—it provides a truer, more comprehensive picture of the "density" of care and supervision. The assessor will now apply this metric to the "Little Sprouts" preschool classroom.

2.1. The 6 Core Questions: Gathering Operational Data

To calculate the Contact Hours, the assessor asks the center director six simple questions about the preschool classroom's daily operations.

1. *When does your first teaching staff arrive or when does your facility open (TO1)?*
    a. **Answer:** 7:00 AM
2. *When does your last teaching staff leave or when does your facility close (TO2)?*
    a. **Answer:** 5:00 PM
3. *Number of teaching/caregiving staff (TA)?*
    a. **Answer:** 2
4. *Number of children on your maximum enrollment day (NC)?*
    a. **Answer:** 18
5. *When does your last child arrive (TH1)?*
    a. **Answer:** 9:00 AM
6. *When does your first child leave (TH2)?*
    a. **Answer:** 3:00 PM

2.2. From Data to Insight: Calculating and Interpreting the CH Score

With this data, the CCEEHM App automatically performs the calculation. The scenario at "Little Sprouts"—where children arrive and leave gradually—is the most common and corresponds to a trapezoidal model.

- **Step 1: Calculate Total Operating Hours (TO)**
    - TO = TO2 - TO1 = 5:00 PM - 7:00 AM = 10 hours
- **Step 2: Calculate Total Hours at Full Enrollment (TH)**
    - TH = TH2 - TH1 = 3:00 PM - 9:00 AM = 6 hours
- **Step 3: Apply the Trapezoidal Formula**

eBook
www.bookemon.com
rfiene@rikinstitute.com

    - CH = ((NC * (TO + TH)) / 2) / TA
    - CH = ((18 * (10 + 6)) / 2) / 2
    - CH = ((18 * 16) / 2) / 2
    - CH = (288 / 2) / 2
    - CH = 144 / 2
    - **CH = 72**
- **Step 4: Interpret the Result**
    - The assessor uses the **Contact Hour (CH) Conversion Table** to interpret this score. They locate the row for the Number of Children (NC=18).
    - The required adult-child ratio for 18 preschool-aged children with 2 staff members is 1:9.
    - Looking at the table, the corresponding Contact Hour value for NC=18 and a 1:9 ratio is **72**.

Finding: The calculated CH score for "Little Sprouts" is **72**, which represents the total 'child-hour load' per staff member. By exactly matching the maximum allowable value in the conversion table for their number of children and staff, it confirms that at no point during the day does the child density exceed the regulated 1:9 ratio. This indicates that the preschool classroom is **in full compliance** with structural quality standards.

This confirmation of structural compliance provides a critical foundation for safety and supervision. However, it's only half the story. The assessor now turns to the CCEEHM's process quality indicators to evaluate the 'heart' of the program: the daily interactions that drive child development.

3. Part II: Assessing Process Quality with the Program Quality Indicators (PQI)

The **Program Quality Indicators (PQI)** are a set of 10 key indicators used to measure process quality. These indicators evaluate the dynamic interactions, curriculum, and environment that are crucial for healthy child development. The assessor now proceeds to evaluate "Little Sprouts" against these 10 PQIs, scoring each on a 1-4 scale.

3.1. Document and Policy Review (PQI 1-5)

The first five indicators are assessed by reviewing staff records, curriculum documents, and family communication policies.

PQI 1: Number of ECE III Educators

eBook
www.bookemon.com
rfiene@rikinstitute.com

- **Assessor's Findings at Little Sprouts:** The assessor reviews the Staff Information Summary form. They find that there are a total of 4 teaching staff working over 65 hours/month at the center. Of those four, 3 hold an ECE III Certification (equivalent to an AA or BA level).
- **Scoring:**
    - (3 ECE III Staff / 4 Total Teaching Staff) * 100% = 75%
    - This percentage falls into the "51 to 75%" range.
    - **Final Score: 3**

PQI 2: Stimulating and Dynamic Environment

- **Assessor's Findings at Little Sprouts:** The assessor reviews the center's *Play and Exploration* guide and observes the classrooms. They note that children can access materials independently, family photos are displayed, and there is strong evidence of children's interests reflected in classroom projects. Out of the 11 items on the checklist, 9 are marked "Y" (Yes).
- **Scoring:**
    - (9 Yes / 11 Total Items) * 100% = 81.8%
    - This percentage falls into the "76 to 100%" range.
    - **Final Score: 4**

PQI 3: Developmentally Appropriate Curriculum Based on Assessments

- **Assessor's Findings at Little Sprouts:** The assessor randomly samples the records for 10 children. They look for a clear link between individual child assessments, an emergent curriculum approach, and documented learning activities. For 8 of the 10 children, the records show that all three key elements are present and well-documented.
- **Scoring:**
    - (8 Positive Records / 10 Total Records) * 100% = 80%
    - This percentage falls into the "76 to 100%" range.
    - **Final Score: 4**

PQI 4: Opportunities for Staff and Families to Get to Know Each Other

- **Assessor's Findings at Little Sprouts:** Reviewing program policies and interviewing the director, the assessor finds strong evidence of two-way communication (a parent-teacher app) and materials delivered to meet diverse family needs.

eBook www.bookemon.com
rfiene@rikinstitute.com

However, there is no formal policy ensuring the program respects each family's individual goals for their children. Two of the three required examples are met.

- **Scoring:**
  - (2 Yes / 3 Total Items) * 100% = 66.7%
  - This percentage falls into the "51 to 75%" range.
  - **Final Score: 3**

PQI 5: Families Receive Information on Their Child's Progress Regularly

- **Assessor's Findings at Little Sprouts:** The center's records show that they conduct parent-teacher conferences twice a year and provide families with a written report on their child's developmental progress. However, there is no evidence that these materials are consistently adapted to be culturally and linguistically appropriate for all families.
- **Scoring:** The program meets the criteria for item 5.1 (conferences and reports), earning 3 points. However, it does not meet the criteria for item 5.4 (culturally and linguistically appropriate materials), earning 0 additional points, for a **Final Score of 3**.

3.2. Classroom Observations (PQI 6-10)

The remaining indicators require direct observation of educator-child interactions in the classrooms.

PQI 6: Educators Encourage Children to Communicate (Preschool Class)

- **Assessor's Findings at Little Sprouts:** During a 15-minute observation in the preschool room, the assessor notes that communication activities happen during both free play and group times. For example, a teacher helps a small group discuss a recent trip to the store. Materials that encourage communication, like puppets and dramatic play props, are available in multiple interest centers. Both criteria for a level "3" score are met.
- **Scoring:** All "Y"s are checked for the level 3 criteria.
  - **Final Score: 3**

PQI 7: Infant Toddler Observation (Infant Classroom)

- **Assessor's Findings at Little Sprouts:** In the infant-toddler room, the assessor observes for 15 minutes. Staff sometimes initiate conversations (e.g., babbling back

eBook www.bookemon.com
rfiene@rikinstitute.com

and forth with an infant) and ask appropriate questions, waiting for a non-verbal response. They respond neutrally when a toddler can't answer. The criteria for a level "2" score are fully met, but higher-level personalized conversations are not consistently observed.

- **Scoring:** All "Y"s are checked for the level 2 criteria.
    - **Final Score: 2**

PQI 8: Educators Use Language to Develop Reasoning Skills (Preschool)

- **Assessor's Findings at Little Sprouts:** The assessor observes a teacher talking with children about logical relationships while they play with sorting games. Later, another educator encourages a child to explain *why* she sorted blocks into two different piles. Both criteria for a level "3" score are clearly observed.
- **Scoring:** All "Y"s are checked for the level 3 criteria.
    - **Final Score: 3**

PQI 9: Educators Listen Attentively When Children Speak

- **Assessor's Findings at Little Sprouts:** Over ten 2-minute observation periods in both classrooms, the assessor rates how attentively educators listen to children on a 1-4 Likert scale. The ratings are: 4, 3, 4, 3, 3, 2, 4, 3, 4, 3.
- **Scoring:**
    - Total score = 4 + 3 + 4 + 3 + 3 + 2 + 4 + 3 + 4 + 3 = 33
    - Average = 33 / 10 = 3.3
    - The average score of 3.3 is rounded to the nearest whole number, resulting in a **Final Score of 3**, as per the scoring protocol.

PQI 10: Educators Speak Warmly to Children

- **Assessor's Findings at Little Sprouts:** Using the same observation method, the assessor rates the warmth of educator's tone and body language. The ratings are: 4, 4, 3, 4, 4, 3, 4, 4, 3, 4.
- **Scoring:**
    - Total score = 4 + 4 + 3 + 4 + 4 + 3 + 4 + 4 + 3 + 4 = 37
    - Average = 37 / 10 = 3.7
    - The average score of 3.7 is rounded to the nearest whole number, resulting in a **Final Score of 4**, as per the scoring protocol.

eBook www.bookemon.com
rfiene@rikinstitute.com

With the data collection for all 10 Program Quality Indicators complete, the assessor can now synthesize these results to create a comprehensive quality profile for the center.

4. Part III: Synthesizing the CCEEHM Results

The final step is to combine the CH metric results and the individual PQI scores to generate an overall quality level for "Little Sprouts Early Learning Center."

4.1. The PQI Score Summary

The CCEEHM App automatically populates a summary table with the final scores for each indicator.

Indicator Name	Final Score
PQI 1: ECE III Educators	3
PQI 2: Stimulating & Dynamic Environment	4
PQI 3: Developmentally Appropriate Curriculum	4
PQI 4: Staff & Family Opportunities	3
PQI 5: Child's Progress Information	3
PQI 6: Encourage Communication (Preschool)	3
PQI 7: Infant Toddler Observation	2
PQI 8: Language for Reasoning Skills (Preschool)	3
PQI 9: Educators Listen Attentively	3
PQI 10: Educators Speak Warmly	4

eBook
www.bookemon.com
rfiene@rikinstitute.com

To determine the quality level for the preschool program, the assessor sums the scores for all relevant indicators. **PQI 7 is excluded** as it applies only to the infant-toddler room.

- **Preschool Total Score:** 3 + 4 + 4 + 3 + 3 + 3 + 3 + 3 + 4 = **30**

4.2. Determining the Overall Quality Level

Using the total score of **30**, the assessor refers to the **Program Quality Indicators Artificial Intelligence (PQIAI) Scoring Protocol** table for the preschool age group.

- A score of 30 falls within the range of **26 - 31**.
- This corresponds to a final quality level of **High-Mid Quality**.

5. Conclusion: The Holistic Picture of "Little Sprouts"

The CCEEHM assessment provides a comprehensive and nuanced picture of the "Little Sprouts Early Learning Center." The evaluation reveals two key findings:

1. **Strong Structural Quality:** The Contact Hour (CH) metric score of 72 demonstrates that the center maintains compliant staff-child ratios throughout the entire operating day, providing a safe and well-supervised foundation.
2. **High-Mid Process Quality:** The total PQI score of 30 places the preschool program in the "High-Mid Quality" category. The 'High-Mid' rating, while strong, points to clear opportunities for targeted professional development. Specifically, the scores for **PQI 4 (Staff & Family Opportunities)** and **PQI 9 (Educators Listen Attentively)** suggest that training focused on enhancing family engagement strategies and practicing active listening techniques could elevate the program to the 'High Quality' tier.

Ultimately, this case study illustrates the primary benefit of the CCEE Heart Monitor: its ability to move beyond separate, disconnected assessments. By integrating structural and process measures, it provides a cost-effective, efficient, and deeply insightful picture of program quality, giving providers and policymakers a much clearer path toward meaningful improvement.

eBook
www.bookemon.com
rfiene@rikinstitute.com

Case Study 2: Applying the CCEE Heart Monitor to the 'Little Sprouts' Early Learning Center

Introduction: A New Lens on Program Quality

Welcome to the 'Little Sprouts' Early Learning Center, a fictional community-based program serving infants and preschoolers. Like many centers, 'Little Sprouts' is dedicated to providing a safe, nurturing, and educational environment. But how can we measure the quality of that environment in a way that is both comprehensive and meaningful?

This case study will walk you through a quality assessment of the 'Little Sprouts' preschool classroom using a new, integrated tool: the **Child Care and Early Education Heart Monitor (CCEEHM)**. We will explore how this system moves beyond simple compliance checklists to provide a holistic view of the program's health.

The CCEEHM is an integrated system designed to assess both **structural quality** and **process quality** in one platform. Structural quality refers to foundational elements like health, safety, staff-child ratios, and group sizes. Process quality is the "heart" of the matter—it measures the quality of the daily interactions between adults and children, where true learning and development happen. This entire process is facilitated through a software application (App) that simplifies data entry and automates scoring, making it a cost-effective and efficient tool for assessors.

The CCEEHM's breakthrough is its ability to measure process quality *within the context of* the structural framework provided by the Contact Hour metric, moving beyond the traditional approach of using separate, disconnected tools for licensing and quality assessment. Let's see how it works at 'Little Sprouts'.

1. Part One: Assessing Structural Quality with the Contact Hour (CH) Metric

Our first step is to evaluate the program's structural foundation. Instead of just checking ratios at a single moment in time, the CCEEHM uses the **Contact Hour (CH) metric**. Unlike

eBook
www.bookemon.com
rfiene@rikinstitute.com

a traditional spot-check, which only captures a single moment, the CH metric provides a more accurate picture of a program's day by accounting for the ebb and flow of children arriving and departing, revealing the true density of care.

1.1. Data Collection for the Preschool Classroom

To begin, we ask six simple questions about the preschool classroom's daily operations.

The Six CH Questions	'Little Sprouts' Preschool Classroom Data
1. When does your first teaching staff arrive or when does your facility open (TO1)?	**7:00 AM**
2. When does your last teaching staff leave or when does your facility close (TO2)?	**5:00 PM**
3. Number of teaching/caregiving staff (TA)?	**2**
4. Number of children on your maximum enrollment day (NC)?	**16**
5. When does your last child arrive (TH1)?	**9:00 AM**
6. When does your first child leave (TH2)?	**3:00 PM**

1.2. Calculating the Contact Hours (CH)

With this data, we can calculate the CH score. Because the children at 'Little Sprouts' arrive and leave gradually throughout the day, the most appropriate formula is the one that creates a **trapezoidal model**.

First, we determine the key time variables:

- **Total hours open (TO):** 5:00 PM - 7:00 AM = **10 hours**
- **Total hours at full enrollment (TH):** 3:00 PM - 9:00 AM = **6 hours**

eBook
www.bookemon.com
rfiene@rikinstitute.com

Next, we apply the trapezoidal formula from the CCEEHM system:

CH = ((NC (TO + TH)) / 2) / TA

Using the data from 'Little Sprouts':

CH = ((16 * (10 + 6)) / 2) / 2 CH = ((16 * 16) / 2) / 2 CH = (256 / 2) / 2 CH = 128 / 2 CH = 64

The calculated Contact Hour (CH) value for the 'Little Sprouts' preschool classroom is **64**.

1.3. Interpreting the CH Score

A score of 64 is just a number until we compare it to the standard. To do this, we use the **Contact Hour (CH) Conversion Table** (Table 1 from the source document). This table provides the maximum CH value allowed for a program to be considered in compliance with ratio standards.

1. **Find the Number of Children (NC):** We locate the row for NC = 16.
2. **Determine the Required Ratio:** With 16 children and 2 staff members, the required adult-child ratio is 1:8.
3. **Cross-Reference the Values:** We find the intersection of the NC=16 row and the 8:1 ratio column in the table. The value is 64.
4. The calculated CH score for 'Little Sprouts' (64) exactly matches the maximum allowed CH value (64) in the conversion table. This means the program is **in compliance** with structural quality standards for adult-child ratios.

Visualizing the Day

The gradual arrival and departure of children at 'Little Sprouts' creates a daily attendance pattern that most closely resembles the second diagram in the "Potential Density Displays of Contact Hours," which is described as the "most likely scenario."

Having established that 'Little Sprouts' provides a structurally compliant foundation of care using the dynamic CH metric, we can now use the PQI to assess the quality of the 'heart'—the critical adult-child interactions that this stable structure supports.

eBook
www.bookemon.com
rfiene@rikinstitute.com

2. Part Two: Evaluating Process Quality with the Program Quality Indicators (PQI)

With structural compliance confirmed, the CCEEHM shifts focus to process quality—the "heart" of the program. We use the **Program Quality Indicators (PQI)** tool to measure the crucial elements of curriculum, environment, and adult-child interactions in the preschool classroom. These indicators are not arbitrary; they are validated measures drawn from decades of key indicator studies (1980-2020) covering quality rating systems, professional development, and direct observational research.

2.1. Document Review and Staff Interviews (PQI 1-5)

The first five indicators are assessed by reviewing staff records, program policies, and children's portfolios, as well as interviewing staff.

Indicator	'Little Sprouts' Findings	Score (1-4)
1. Number of ECE III Educators	The assessor reviews staff records. Out of 8 total teaching staff at the center, 6 are ECEIII certified. The calculation is (6 / 8) * 100% = 75%. According to the source's scoring protocol, a percentage between 51-75% earns a score of 3.	**3**
2. Stimulating and Dynamic Environment	The assessor observes that children can access materials independently, family photos are displayed, and children's projects are evident—all signs of a child-centered environment where children are respected as competent learners. 9 out of 11 checklist items receive a "Y", for a score of 81.8%. This percentage falls into the highest scoring band of 76-100%.	**4**
3. Developmentally Appropriate Curriculum	Reviewing a sample of 10 children's portfolios, the assessor finds that 8 show a clear, documented link between individual developmental assessments and emergent curriculum activities. A score of (8 / 10) *	**4**

eBook www.bookemon.com
rfiene@rikinstitute.com

	100% = 80% falls into the 76-100% band, earning the highest score.	
4. Opportunities for Staff and Families to Get to Know Each Other	Policies and interviews confirm multiple modes of two-way communication and materials that meet diverse family needs. All 3 checklist items receive a "Y". The 100% score falls into the 76-100% band for the highest rating.	**4**
5. Families Receive Information on Child's Progress	Records show that the center earns 3 points for conducting parent conferences twice a year *and* providing formal progress reports. An additional point is awarded because these communications are offered in multiple languages to be culturally and linguistically appropriate for the families served, resulting in a maximum score of 4.	**4**

2.2. Classroom Observations (PQI 6-10)

The next set of indicators requires direct observation of the interactions happening within the preschool classroom.

Indicator	'Little Sprouts' Findings	Score (1-4)
6. Educators Encourage Children to Communicate (Preschool)	The assessor observes a 15-minute block. Staff link children's spoken stories to writing by jotting them down. Materials like puppets and block-area figures are accessible in multiple centers, and staff balance listening and talking well. All criteria for a Level 4 score are met.	**4**
7. Infant Toddler Observation	Since this case study is focused on the preschool classroom, this indicator is not applicable.	**N/A**

eBook www.bookemon.com
rfiene@rikinstitute.com

8. Educators Use Language to Develop Reasoning Skills (Preschool)	The assessor notes that teachers use daily routines (e.g., "how many spoons do we need for snack time?") to introduce concepts—a best-practice strategy for embedding learning into real, meaningful experiences rather than relying on abstract drills. They also encourage children to explain their reasoning when solving problems. The criteria for a Level 3 score are fully met.	**3**
9. Educators Listen Atten-tively When Children Speak	Over ten 2-minute observation periods, the assessor scores educators' attentiveness. The scores are: 4, 4, 3, 4, 3, 4, 4, 3, 4, 4. The total of 37, divided by 10, yields an average of 3.7. This rounds up to a final score of 4, indicating consistently attentive listening that validates children's contributions.	**4**
10. Educators Speak Warmly to Children	Using the same observation method, the assessor scores the warmth of educators' voices and body language. The scores are: 4, 4, 4, 4, 4, 3, 4, 4, 4, 4. The total is 39. Divided by 10, the average is 3.9, which rounds up to a final score of 4. This consistent warmth builds trust and emotional security for children.	**4**

With detailed data collected on both structural compliance (CH) and interactional quality (PQI), we are now prepared to synthesize these two streams of information into the single, holistic quality profile that is the hallmark of the CCEEHM system.

3. Part Three: Synthesizing the Results for a Holistic Picture

The final step is to combine the CH and PQI results to create a single, comprehensive quality profile for the 'Little Sprouts' preschool classroom.

Using the CCEEHM App, the assessor's inputs for the PQI indicators are automatically tallied. To calculate the total PQI score manually, we add the scores from all *applicable* indicators (excluding PQI 7).

3 + 4 + 4 + 4 + 4 + 4 + 3 + 4 + 4 = 34

eBook
www.bookemon.com
rfiene@rikinstitute.com

Next, we consult the **Program Quality Indicators Artificial Intelligence (PQIAI) Scoring Protocol** table. For a preschool classroom, a score of 32 or higher is categorized as **High Quality**. With a total score of 34, the 'Little Sprouts' preschool classroom clearly falls into this top tier.

The final CCEEHM assessment can be summarized as follows:

Assessment Component	'Little Sprouts' Early Learning Center: Preschool Classroom Results
Structural Quality	The Contact Hour (CH) calculation resulted in a score of **64**. This indicates the program is **in full compliance** with required adult-child ratios and group size regulations.
Process Quality	The Program Quality Indicators (PQI) resulted in a total score of **34**. This places the program in the **High Quality** range for its process quality.
CCEEHM Holistic View	The CCEEHM assessment demonstrates that 'Little Sprouts' not only maintains a safe and structurally sound environment but also excels in providing high-quality, positive, and developmentally rich interactions for its children.

4. Conclusion: The Value of an Integrated Approach

This case study of the 'Little Sprouts' Early Learning Center demonstrates the power of the CCEEHM. The assessment found the program to be structurally compliant via the CH metric and to have high process quality according to the PQI assessment. For a learner new to this field, this integrated approach offers several key lessons.

- **Beyond Compliance:** The CCEEHM shows how a program can be more than just compliant with rules. It provides a framework to see the *quality of the experience* that children are having within a safe and well-managed structure.
- **A Complete Picture:** By integrating structural (CH) and process (PQI) measures, the CCEEHM provides a holistic, data-driven view of a program's overall quality that is far more meaningful than separate assessments.

eBook
www.bookemon.com
rfiene@rikinstitute.com

- **Actionable Insights:** This integrated approach helps program directors and staff identify both their strengths (like the warm interactions observed at 'Little Sprouts') and potential areas for growth in a single, efficient process.

Armed with this holistic CCEEHM report, the director of 'Little Sprouts' can confidently affirm their program's structural integrity to licensing bodies and families. Furthermore, they can use the specific PQI scores to guide professional development, perhaps focusing on enhancing strategies for 'developing reasoning skills' (PQI 8) to move that score from a 3 to a 4, ensuring continuous quality improvement.

eBook
www.bookemon.com
rfiene@rikinstitute.com

Case Study 3: Applying the CCEE Heart Monitor to the "Sunshine Sprouts" Program

Introduction: Understanding the CCEE Heart Monitor

The Child Care and Early Education Heart Monitor (CCEEHM) is a new, integrated system for assessing program quality. It builds upon the Contact Hour (CH) metric and the Key Indicator Methodology (KIM) to provide a unified platform for both licensors and quality assessors.

The core challenge in the Child Care and Early Education (CCEE) field is the need for a unified means to monitor both structural and process quality. Typically, these two domains are measured separately using distinct tools. The CCEEHM addresses this by unifying the monitoring and measurement of both structural and process quality into a single, integrated system.

The "heart monitor" metaphor helps clarify the system's purpose. **Structural quality** components—such as staff-child ratios, group sizes, and health and safety regulations—are essential for protecting children. However, **process quality**—the interactions between staff and children—is the true "heart" of a program. This is the "dance" between adult and child where meaningful development occurs. The CCEEHM integrates these two categories, placing the measurement of process quality squarely within the structural measurement strategy.

This document provides a practical, step-by-step case study of how the CCEEHM evaluates a fictional preschool program, "Sunshine Sprouts." This case will demonstrate a common and revealing scenario: a program with a dangerously high Contact Hour (CH) score, indicating severe overpopulation, that is simultaneously delivering a very low-quality experience. This highlights the unique insights the CCEEHM provides by looking at both quantity and quality together.

We will now introduce the fictional program at the center of our assessment.

eBook
www.bookemon.com
rfiene@rikinstitute.com

1. Profile of the Fictional Program: Sunshine Sprouts

Sunshine Sprouts is a preschool classroom that will serve as the subject of our case study. To begin the CCEEHM assessment, an assessor gathers the following basic operational data, which is essential for calculating the Contact Hour metric.

Program Data Point	Sunshine Sprouts Classroom
Facility Opens (TO1)	6:00 AM
Facility Closes (TO2)	6:00 PM
Number of Teaching Staff (TA)	2
Number of Children (NC)	20 (Preschoolers)
Last Child Arrives (TH1)	9:00 AM
First Child Leaves (TH2)	4:00 PM

With this profile established, we can proceed to the first part of the CCEEHM assessment: calculating the program's structural quality using the Contact Hour metric.

2. Part 1: Assessing Structural Quality with the Contact Hour (CH) Metric

The Contact Hour (CH) metric is the CCEEHM's tool for assessing **structural quality**. It serves as a more effective and efficient metric than traditional methods for measuring compliance with adult-child ratios and group sizes.

The Six Core Questions

To begin, an assessor gathers the data needed for the calculation by asking six simple questions about the program's operations:

eBook
www.bookemon.com
rfiene@rikinstitute.com

1. When does your first teaching staff arrive or when does your facility open (TO1)?
2. When does your last teaching staff leave or when does your facility close (TO2)?
3. Number of teaching/caregiving staff (TA)?
4. Number of children on your maximum enrollment day (NC)?
5. When does your last child arrive (TH1)?
6. When does your first child leave (TH2)?

Calculating the CH for Sunshine Sprouts

Using the data gathered in the program profile, we can calculate the CH score.

- **First, we determine the total hours the facility is open (TO) and the hours at full enrollment (TH):**
  - TO = TO2 - TO1 = 6:00 PM - 6:00 AM = **12 hours**
  - TH = TH2 - TH1 = 4:00 PM - 9:00 AM = **7 hours**
- **Next, we select the appropriate formula.** Given that the hours of full enrollment (TH=7) are a significant portion of the total hours open (TO=12), this scenario is best represented by a rectangular density model, for which the appropriate formula is CH = (NC x TO) / TA;.
- **Finally, we calculate the CH score:**
  - CH = (20 children x 12 hours) / 2 staff
  - CH = 240 / 2
  - CH = 120

Interpreting the CH Score

The raw CH score of **120** represents the program's "exposure time and density." To understand what this number means for regulatory compliance, we compare it to the Table 1: Contact Hour (CH) Conversion Table.

1. We locate the row corresponding to the number of children (**NC = 20**).
2. We then look across that row to find the maximum compliant Relatively Weighted Contact Hour (RWCH) value for a standard preschool ratio, such as 1 adult for every 10 children (1:10).
3. The table shows that for 20 children, the maximum compliant RWCH for a 1:10 ratio is **80**.

eBook
www.bookemon.com
rfiene@rikinstitute.com

The key insight is that Sunshine Sprouts' calculated CH of 120 far exceeds the compliant value of 80. According to the CCEEHM methodology, this indicates the program is "over ratio on ACR standards, in other words, they would be overpopulated."

This high CH score corresponds to the final diagram in the "Potential Density Displays," which "clearly indicates a very high CH and non-compliance with ACR and GS."

While the CH metric has efficiently revealed a significant structural problem—overpopulation—it does not tell us about the *quality* of the interactions within the classroom. For that, we turn to the second part of the assessment.

---

3. Part 2: Assessing Process Quality with the Program Quality Indicators (PQI)

The Program Quality Indicators (PQI) are the CCEEHM's tool for measuring **process quality**. This is the component that assesses the "heart" of the program—the nature of the staff-child interactions, the learning environment, and the curriculum.

Illustrating Low Quality through Key Indicators

An assessor would evaluate Sunshine Sprouts against all relevant indicators. To illustrate the process, we will walk through a fictional assessment of three specific PQIs that demonstrate the program's low quality.

- **PQI 2: Stimulating and Dynamic Environment**
  - **Observation:** An assessor observes the classroom and finds very few materials accessible to children. No child artwork is displayed, and the designated learning centers are disorganized and uninviting. Of the 11 items on the checklist, only 2 are marked 'Y'.
  - **Scoring:** (2 / 11) * 100% = **18%**. Based on the scoring chart (1 = 0 to 25%), this results in a score of **Level 1**.
- **PQI 6: Educators Encourage Children to Communicate (Preschool)**
  - **Observation:** During a 15-minute observation period, the assessor notes that staff primarily give commands ("Stop that," "Time to clean up") and rarely engage in back-and-forth conversations with the children. No specific activities are used to encourage communication, and very few materials like

eBook www.bookemon.com
rfiene@rikinstitute.com

puppets or toy phones are accessible. Opportunities for rich, back-and-forth conversation during a block-building activity were missed entirely.
    - **Scoring:** The observations directly align with the criteria for a Level 1 score (6.1 and 6.2). The program therefore scores a **Level 1**.
- **PQI 10: Educators Speak Warmly to Children**
    - **Observation:** Over ten separate 2-minute observation periods, the assessor consistently notes that educators speak in harsh, flat tones. They frequently seem preoccupied with cleaning tasks and do not make eye contact when addressing children, even when a child was visibly distressed. The average Likert score across the ten observations is 1.2.
    - **Scoring:** An average score of 1.2 is rounded down to the nearest whole number, resulting in a score of **Level 1**.

Summarizing the Final PQI Score

After assessing all relevant indicators for a preschool classroom, the fictional scores for Sunshine Sprouts are compiled:

- **PQI 1:** Level 1
- **PQI 2:** Level 1
- **PQI 3:** Level 1
- **PQI 4:** Level 2
- **PQI 5:** 1 Point
- **PQI 6:** Level 1
- **PQI 8:** Level 1
- **PQI 9:** Level 1
- **PQI 10:** Level 1

The total score is calculated by summing the level for each indicator: 1+1+1+2+1+1+1+1+1 = 10.

According to the Program Quality Indicators Artificial Intelligence (PQIAI) Scoring Protocol table, a total score of **10** for a preschool program (where the threshold is 15 or less) falls squarely in the **Low Quality** category.

Now that we have both the structural (CH) and process (PQI) scores, we can synthesize them to get a complete and insightful picture of the Sunshine Sprouts program.

eBook
www.bookemon.com
rfiene@rikinstitute.com

4. Synthesis: The CCEEHM's Holistic Picture of Sunshine Sprouts

The power of the CCEEHM lies in its ability to integrate structural and process quality data into a single, understandable assessment.

Summary of Findings

Metric	Finding	Implication
Contact Hour (CH)	Score: 120 (**Very High**)	Indicates non-compliance with staff-child ratios; the classroom is overpopulated.
Program Quality (PQI)	Score: 10 (**Low Quality**)	Indicates poor interactions, an unstimulating environment, and a lack of quality curriculum.

The Combined Insight

Looking at either the CH or PQI score alone would provide an incomplete and potentially misleading picture. A traditional structural assessment might only note the ratio violation, while a separate process quality observation might miss the underlying structural stressor of overpopulation. The CCEEHM's integrated approach reveals the critical story for Sunshine Sprouts. This allows us to draw a direct line from the structural failure (too many children for the staff to manage effectively) to the subsequent process quality collapse (stressed, unresponsive educators who lack the capacity for warm, engaging interactions). Overpopulation is not just a compliance violation; it is the root cause of the poor developmental experience documented by the PQI score. The CCEEHM moves beyond simple compliance checking to measure the true developmental experience of the children in the program.

This holistic view is crucial for providing targeted support and making meaningful improvements.

eBook
www.bookemon.com
rfiene@rikinstitute.com

5. Conclusion: Why an Integrated Approach Matters

The Sunshine Sprouts case study demonstrates how the CCEEHM can identify a program with a dangerously high CH score indicating severe overpopulation that is simultaneously providing a low-quality developmental experience (a low PQI score). This scenario, where a structural failure is intertwined with a process failure, is precisely what single-focus assessment tools often miss.

By unifying the measurement of structural and process elements, the CCEEHM provides a more cost-effective, efficient, and comprehensive understanding of program quality. This integrated picture is essential for truly understanding the challenges programs face and for implementing targeted interventions that can improve the daily experiences and long-term outcomes for children.

eBook
www.bookemon.com
rfiene@rikinstitute.com

Application of the Child Care and Early Education Heart Monitor (CCEEHM) to a Hypothetical Program

1.0 Introduction: The CCEEHM Framework for Integrated Quality Assessment

The Child Care and Early Education Heart Monitor (CCEEHM) is a modern assessment tool designed to provide a unified, comprehensive evaluation of early learning environments. It moves beyond traditional, siloed approaches by integrating the two fundamental pillars of quality—structural and process—into a single, data-driven platform. This document will demonstrate the application and diagnostic power of the CCEEHM by evaluating a hypothetical program exhibiting significant quality deficiencies.

The CCEEHM framework is built upon two core components as described in its foundational documentation:

- **The Contact Hour (CH) Metric:** This innovative metric assesses **structural quality**, specifically compliance with adult-child ratios and group size regulations. It offers a more dynamic and accurate measure than static counts by incorporating the dimensions of time and population density.
- **The Program Quality Indicators (PQI):** This set of 10 indicators assesses **process quality**, which is often called the "heart" of early education. The PQIs evaluate the quality of daily interactions, the educational environment, and the relationships between educators, children, and families.

The following analysis will first calculate the Contact Hour (CH) metric to determine the hypothetical program's structural integrity. Subsequently, it will systematically score each Program Quality Indicator (PQI) to build a detailed process quality profile. Together, these results will generate a comprehensive, data-driven assessment of the program's overall quality.

eBook
www.bookemon.com
rfiene@rikinstitute.com

2.0 Profile of the Hypothetical Program Under Review

To effectively demonstrate the CCEEHM's diagnostic capabilities, a scenario representing a low-quality program has been established. The characteristics of this program are designed to highlight common areas of critical deficiency in early childhood education. This section outlines the specific conditions that will serve as the basis for all subsequent calculations and evaluations within the CCEEHM framework.

The defining characteristics of the hypothetical program are as follows:

- **Staffing Ratios:** The program is consistently understaffed, with too many children present for the number of teachers on duty, violating standard ratio requirements.
- **Curriculum & Assessment:** There is no formal curriculum to guide learning activities, nor is there a system in place for assessing individual child development to inform instruction.
- **Parental Communication:** Communication with parents is minimal and unstructured, with few to no formal opportunities for families to receive information about their child's progress or to build relationships with staff.
- **Teacher Qualifications:** The teaching staff lack the required credentials and qualifications according to established early childhood education (ECE) standards.
- **Teacher-Child Interactions:** Interactions between teachers and children are infrequent, superficial, and of low quality, lacking the warmth and educational depth necessary for healthy development.

Having established this profile, the analysis will now proceed to the first part of the assessment: an evaluation of structural quality using the Contact Hour metric.

3.0 Structural Quality Analysis: Contact Hour (CH) Metric Calculation

The Contact Hour (CH) metric is a cornerstone of the CCEEHM framework, offering a strategic advantage over traditional compliance checks. It moves beyond a static snapshot of adult-child ratios to a more dynamic measure that accounts for how ratios fluctuate over the course of a day. By incorporating time and the density of the child population, the CH metric provides a more accurate and nuanced picture of potential overpopulation in a classroom, which is a key indicator of structural risk.

eBook
www.bookemon.com
rfiene@rikinstitute.com

CH Metric Data Inputs and Assumptions

To perform the calculation for the hypothetical program, the following operational data points are assumed. These values have been selected to reflect a program struggling with understaffing and high enrollment, consistent with its low-quality profile.

Question	Assumption for Hypothetical Program	Variable
1. When does your first teaching staff arrive?	8:00 AM	TO1
2. When does your last teaching staff leave?	6:00 PM	TO2
3. Number of teaching/caregiving staff?	2	TA
4. Number of children on maximum enrollment day?	30	NC
5. When does your last child arrive?	9:00 AM	TH1
6. When does your first child leave?	5:00 PM	TH2

CH Calculation and Interpretation

Based on the assumptions above, the intermediate values for TO (Total hours open) and TH (Total hours at full enrollment) are calculated first.

- **Total Hours Open (TO):** TO2 (6:00 PM) - TO1 (8:00 AM) = **10 hours**
- **Total Hours at Full Enrollment (TH):** TH2 (5:00 PM) - TH1 (9:00 AM) = **8 hours**

The appropriate formula for a typical day where children arrive and depart gradually, forming a trapezoidal density distribution, is used for the final calculation.

eBook
www.bookemon.com
rfiene@rikinstitute.com

- **Formula:** CH = ((NC * (TO + TH)) / 2) / TA
- **Calculation:** CH = ((30 * (10 + 8)) / 2) / 2
- **Calculation:** CH = ((30 * 18) / 2) / 2
- **Calculation:** CH = (540 / 2) / 2
- **Calculation:** CH = 270 / 2
- **Calculated CH Value: 135**

To interpret this result, the calculated CH value is compared to the compliant reference value in the CCEEHM's Table 1: Contact Hour (CH) Conversion Table. Assuming a standard preschool ratio of 1 teacher for every 10 children (1:10), a program with 30 children would require 3 staff members to be compliant. According to Table 1, the maximum compliant CH value for 30 children at a 1:10 ratio is **80**.

The hypothetical program's calculated CH value of **135** significantly exceeds the compliant reference value of **80**. This result provides a clear, quantitative indicator that the program is non-compliant with adult-child ratio standards. The high CH value confirms a state of overpopulation, where too few adults are responsible for too many children over a prolonged period.

Having established a critical failure in structural quality, the analysis will now proceed to evaluate the program's process quality using the Program Quality Indicators.

4.0 Process Quality Analysis: Program Quality Indicators (PQI) Evaluation

The Program Quality Indicators (PQI) are designed to assess the "heart" of quality—the daily experiences, interactions, and educational environment that directly shape a child's development. These 10 indicators move beyond structural rules to measure the nuanced, interactive elements of an early learning program. Each indicator will be scored on a 1-4 scale, with justifications directly linked to the hypothetical program's defined characteristics, to create a comprehensive profile of its process quality.

Detailed PQI Scoring

Indicator 1: Number of ECE III Educators

eBook www.bookemon.com
rfiene@rikinstitute.com

This indicator measures the percentage of teaching staff who hold advanced credentials (AA or BA level) in early childhood education. A highly qualified staff is a key predictor of program quality.

Justification for Score: The hypothetical program is explicitly defined as having "unqualified staff." This means the percentage of educators with ECE III or equivalent credentials is zero. According to the CCEEHM scoring protocol, a percentage between 0% and 25% corresponds to the lowest possible performance level.

Assigned Score: 1

Indicator 2: Stimulating and Dynamic Environment

This indicator assesses whether the learning environment is child-centered, offers meaningful choices, and reflects children's interests through its materials and displays.

Justification for Score: The source text provides a checklist of 11 items to measure this indicator. A program with "no curriculum" and "unqualified staff" would fail on nearly all points. An observer would not find evidence of 'Co-teaching,' 'Authentic and meaningful materials,' or 'Documentation of learning... displayed.' The resulting score of 0-25% on the checklist places the program squarely at the lowest performance level.

Assigned Score: 1

Indicator 3: Developmentally Appropriate Curriculum Based on Assessments

This indicator evaluates whether the program uses a curriculum that is informed by the individual developmental assessments of each child, ensuring a personalized and effective learning experience.

Justification for Score: The program's profile states it has "no formal curriculum or system for assessing child development." This represents a complete failure to meet the criteria for this indicator, which requires a documented link between individual assessment and curriculum planning. A review of children's records would reveal a 0% compliance rate.

Assigned Score: 1

Indicator 4: Opportunities for Staff and Families to Get to Know Each Other

This indicator measures the presence of policies and practices that foster strong, two-way communication and relationship-building between program staff and families.

eBook
www.bookemon.com
rfiene@rikinstitute.com

Justification for Score: The program is characterized by "little to no structured communication with parents." This deficiency means it fails to provide the required evidence of two-way communication, educational opportunities, and respectful engagement with families, resulting in a score of 0-25% on the associated checklist.

Assigned Score: 1

Indicator 5: Families Receive Information on Their Child's Progress Regularly

This indicator assesses whether families are formally and regularly updated on their child's developmental progress through mechanisms like parent-teacher conferences and written reports.

Justification for Score: Given the lack of a child assessment system (Indicator 3) and poor parental communication (Indicator 4), the program has no foundation upon which to report child progress. It would score zero on the CCEEHM's 4-point measurement scale for this indicator, as it provides neither parent conferences nor written reports based on developmental data.

Assigned Score: 1

Indicator 6: Educators Encourage Children to Communicate

This observational indicator measures whether educators actively use materials and conversational strategies to encourage back-and-forth communication with and among children.

Justification for Score: The program's "minimal and low-quality interactions" directly align with the scoring criteria for a "1" on this indicator. An observer would find that "No activities used by staff with children to encourage them to communicate" and that there are "Very few materials accessible that encourage children to communicate," leading to the lowest possible score.

Assigned Score: 1

Indicator 7: Infant Toddler Observation

eBook
www.bookemon.com
rfiene@rikinstitute.com

This indicator is specifically designed to assess communication and interaction quality within infant and toddler classrooms.

Justification for Score: The Contact Hour calculation was based on a standard preschool ratio, and therefore this evaluation assumes a preschool classroom context. This indicator is not applicable to the current assessment.

Assigned Score: N/A

Indicator 8: Educators Use Language to Develop Reasoning Skills

This indicator observes whether educators use language to help children understand logical relationships, solve problems, and think critically during daily activities.

Justification for Score: The scoring criteria for a "1" on this indicator specify that "Staff do not talk with children about logical relationships" and "Concepts are introduced inappropriately." The hypothetical program, characterized by unqualified staff and low-quality interactions, directly embodies these failures, making a score of 1 unavoidable.

Assigned Score: 1

Indicator 9: Educators Listen Attentively When Children Speak

This indicator measures whether educators give children their undivided attention, make eye contact, and use verbal and nonverbal cues to show they are actively listening.

Justification for Score: This indicator is scored via timed observations on a 1-4 Likert scale. In an environment with "low-quality interactions," observers would consistently record a '1' (Never/Not at All), as educators would be disengaged, preoccupied, or failing to get on the child's level. The average observational score would therefore be 1.

Assigned Score: 1

Indicator 10: Educators Speak Warmly to Children

This indicator assesses the emotional tone of staff-child communication, looking for caring, respectful, and warm verbal and nonverbal language.

Justification for Score: Similar to the previous indicator, this is scored via timed observation. A program defined by "low-quality interactions" would lack the consistent warmth required for a high score. Interactions would more likely be perfunctory or harsh,

eBook
www.bookemon.com
rfiene@rikinstitute.com

leading to consistent observational scores of '1' (Never/Not at All) and a final assigned score of 1.

Assigned Score: 1

With each of the applicable indicators scored, the analysis can now move to a synthesized summary and final conclusion.

5.0 Synthesized CCEEHM Assessment and Final Conclusion

This final section integrates the findings from both the structural (Contact Hour metric) and process (Program Quality Indicators) analyses to render a holistic quality verdict, as intended by the Child Care and Early Education Heart Monitor (CCEEHM) framework. By combining these two distinct but interconnected domains, the CCEEHM provides a complete and undeniable picture of the program's performance.

PQI Scoring Summary and Final Verdict

The scores assigned to the applicable Program Quality Indicators for the hypothetical preschool program are summarized below.

Program Quality Indicator	Assigned Score
1. ECE III Educators	1
2. Stimulating Environment	1
3. Curriculum & Assessment	1
4. Staff/Family Opportunities	1
5. Child Progress Information	1
6. Encourage Communication	1

eBook www.bookemon.com
rfiene@rikinstitute.com

7. Infant/Toddler Observation	N/A
8. Language for Reasoning	1
9. Listen Attentively	1
10. Speak Warmly	1
Total Score (Preschool)	**9**

According to the "PQIAI Scoring Protocol," a total score for a preschool program that is 15 or less falls squarely into the **"Low Quality"** category. The hypothetical program's total score of 9 is well within this range, confirming a systemic failure in process quality.

Integrated Conclusion

The comprehensive assessment conducted using the CCEEHM framework reveals critical failures in *both* foundational areas of early childhood education quality. The two components of the monitor worked in concert to identify distinct yet related deficiencies, painting a full picture of a program in crisis.

The Contact Hour (CH) metric exposed a fundamental structural deficiency. The calculated CH value of 135 far exceeded the compliant threshold of 80, providing quantitative proof that the program is overpopulated and non-compliant with mandatory adult-child ratio standards. This failure in structural quality creates an environment that is inherently unsafe and stressful for both children and staff.

Simultaneously, the Program Quality Indicators (PQI) assessment demonstrated a pervasive failure in process quality. The total score of 9 places the program in the lowest quality tier, reflecting an environment devoid of the essential interactions and educational supports necessary for child development. This poor performance is a direct result of unqualified staff, the complete absence of a curriculum and assessment cycle, poor communication with families, and a lack of warm, stimulating, and cognitively rich interactions.

eBook
www.bookemon.com
rfiene@rikinstitute.com

Ultimately, the CCEEHM's integrated approach provides regulators, administrators, and stakeholders with a clear, comprehensive, and undeniable assessment of this hypothetical program's profound inability to provide a safe, healthy, and developmentally appropriate environment for the children in its care.

eBook
www.bookemon.com
rfiene@rikinstitute.com

CCEEHM Framework Analysis: Evaluating a High-Quality, Reduced-Hour Early Childhood Program Model

1.0 Introduction: A New Lens for Assessing Program Quality

This report conducts a detailed evaluation of a specific early childhood program model using the innovative Child Care and Early Education Heart Monitor (CCEEHM), a new Integrated Program Monitoring System. The program under review is characterized by a unique operational structure: reduced daily hours of operation coupled with an increased number of highly qualified teachers. This model presents a potential solution to the persistent "trilemma" in early childhood education: the challenge of balancing quality, affordability, and accessibility. Traditional assessment methods, which often examine structural and process quality in isolation, may fail to capture the holistic value of such a model. The CCEEHM moves beyond the traditional, disconnected tools used by licensing inspectors and quality observers, unifying these assessments into a single, cohesive evaluation. By integrating both structural and process quality metrics, the CCEEHM provides a more comprehensive methodology for assessing the true value of this program. A clear understanding of the CCEEHM framework is essential before applying it to the specific program scenario.

2.0 The CCEEHM Framework: Integrating Structural and Process Quality

The CCEEHM framework represents a strategic evolution in the monitoring of early childhood education. It is designed to move beyond the traditional, disconnected assessment of structural quality (e.g., ratios, group sizes) and process quality (e.g., educator-child interactions). By combining these two critical domains into a single, integrated platform, the CCEEHM offers a unified system that provides a more complete picture of a program's overall effectiveness. This integrated approach allows for a nuanced

eBook
www.bookemon.com
rfiene@rikinstitute.com

analysis of how foundational health and safety standards intersect with the rich, developmental experiences that define the "heart" of a quality program.

2.1 Structural Quality: The Contact Hour (CH) Metric

The Contact Hour (CH) metric is the CCEEHM's foundation for assessing structural quality. It is designed to replace static adult-child ratios and group sizes with a more dynamic measure that reflects the true density and exposure time within a classroom over an entire day. By calculating the total exposure time between adults and children, the CH metric builds a "trapezoidal model" to determine compliance, offering a more realistic view of classroom dynamics. To gather the necessary data for the CH calculation, the following six questions are used:

1. When does your first teaching staff arrive or when does your facility open (TO1)?
2. When does your last teaching staff leave or when does your facility close (TO2)?
3. Number of teaching/caregiving staff (TA)?
4. Number of children on your maximum enrollment day (NC)?
5. When does your last child arrive (TH1)?
6. When does your first child leave (TH2)?

2.2 Process Quality: The Program Quality Indicators (PQI)

The Program Quality Indicators (PQI) serve as the CCEEHM's method for assessing the "heart" of quality—the daily interactions, learning environment, and developmental activities that promote positive child outcomes. The PQIs consist of a set of ten validated indicators drawn from extensive research in the field. These indicators provide a robust measurement of process quality, covering critical areas such as staffing qualifications, curriculum design, parental involvement, and the nature of educator-child interactions. The next step is to analyze the specific program model using these two interconnected components of the CCEEHM framework.

3.0 Program Scenario and Analytical Assumptions

This analysis evaluates a hypothetical early childhood program model defined by a strategic focus on staff quality and engagement over extended operational hours. The program exhibits the following core characteristics:

- **Staffing Model:** Increased number of teachers relative to the number of children.

eBook
www.bookemon.com
rfiene@rikinstitute.com

- **Operational Model:** Reduced hours of operation.
- **Staff Qualifications:** All teachers are highly qualified.
- **Curriculum & Assessment:** Enriched curriculum with appropriate, individualized child assessments.
- **Family Engagement:** Excellent communication with parents, including sharing of child assessments.
- **Observed Interactions:** Consistently positive, warm, loving, interactive, and stimulating exchanges between teachers and children.

To facilitate a quantitative analysis using the Contact Hour metric, the following specific and reasonable assumptions have been established for the program:

- **Number of Children (NC):** 12
- **Number of Teaching Staff (TA):** 3
- **Total Hours Open (TO):** 6 hours (e.g., 8:00 AM to 2:00 PM)
- **Total Hours at Full Enrollment (TH):** 4 hours (e.g., last child arrives at 9:00 AM, first child leaves at 1:00 PM)

These assumptions will now be used to calculate the program's Contact Hour score as the first part of the structural analysis.

4.0 Part 1: Structural Quality Analysis via the Contact Hour (CH) Metric

This section quantitatively assesses the program's structural quality by applying the Contact Hour (CH) metric formula. Using the operational parameters defined in the previous section, this calculation will determine the program's compliance with established adult-child ratio standards, providing a data-driven measure of its foundational safety and integrity.

The CH score is calculated using the first formula provided in the source documentation, which accounts for staggered arrival and departure times.

CH = ((NC * (TO + TH)) / 2) / TA

Where:

- *NC (Number of Children) = 12*

eBook
www.bookemon.com
rfiene@rikinstitute.com

- *TO (Total Hours Open) = 6*
- *TH (Total Hours at Full Enrollment) = 4*
- *TA (Number of Teaching Staff) = 3*

Calculation:

- CH = ((12 * (6 + 4)) / 2) / 3
- CH = ((12 * 10) / 2) / 3
- CH = (120 / 2) / 3
- CH = 60 / 3
- CH = 20

The calculated Contact Hour (CH) score for this program is **20**.

To interpret this score, we compare it to the benchmark values in the CCEEHM's Conversion Table, which lists the maximum allowable Relatively Weighted Contact Hour (RWCH) for different group compositions. For a program with 12 children (NC) and a 1:4 adult-child ratio (12 children ÷ 3 staff), the corresponding RWCH value in Table 1 is **32**.

The analysis reveals that the program's calculated CH score of 20 is well below the maximum allowable RWCH of 32 for its composition. According to the CCEEHM methodology, a program is considered out of compliance if its calculated score *exceeds* the value in the table. Therefore, this program is **fully in compliance** with structural quality standards. This favorable score is a direct result of the program's strategic model: the increased number of teachers (TA=3) and reduced hours of operation (TO=6) combine to create a low-density, high-supervision environment, demonstrating exceptional structural integrity. While structural quality is strong, a complete evaluation requires an assessment of the program's process quality.

5.0 Part 2: Process Quality Analysis via Program Quality Indicators (PQI)

This section evaluates the program's process quality—what the CCEEHM framework describes as the "heart" of early childhood education. To accomplish this, the program's defined characteristics will be scored against the ten Program Quality Indicators (PQIs). This assessment provides insight into the richness of the learning environment and the quality of interactions that children experience daily.

eBook
www.bookemon.com
rfiene@rikinstitute.com

The table below presents the PQI assessment, with scores and rationales derived directly from the program's high-quality characteristics.

Program Quality Indicator (PQI)	Supporting Evidence	Assessed Score (1-4)	Rationale for Score
1. Number of ECE III Educators	"All teachers are highly qualified."	**4**	A score of 4 corresponds to 76-100% of staff holding high-level qualifications. The program's commitment to hiring only highly qualified teachers meets this criterion.
2. Stimulating and Dynamic Environment	"Enriched curriculum" and "Consistently... stimulating exchanges."	**4**	An enriched curriculum and stimulating interactions directly support a dynamic, child-centered environment where children are viewed as competent learners.
3. Developmentally Appropriate Curriculum	"Enriched curriculum with appropriate, individualized child assessments."	**4**	The program's practice of linking an enriched curriculum to individualized assessments ensures a developmentally appropriate, emergent approach to learning.
4. Opportunities for Staff and Families	"Excellent communication with parents."	**4**	Excellent communication fosters opportunities for staff and families to build relationships and engage in ongoing, two-way dialogue.
5. Families Receive Info on Progress	"Excellent communication with parents, including sharing of child assessments."	**4**	The explicit practice of sharing child assessments with parents via formal mechanisms demonstrates a commitment to keeping families informed of their child's progress.

eBook www.bookemon.com
rfiene@rikinstitute.com

6. Educators Encourage Communication	"Consistently positive, warm, loving, interactive, and stimulating exchanges."	**4**	The observed high quality of teacher-child interactions ensures that educators are actively encouraging communication through listening, conversation, and linking spoken language to writing.
7. Infant Toddler Observation	N/A - Preschool Program Assumed	**N/A**	This indicator is specific to infant and toddler classrooms per the source framework and is therefore not applicable to the assumed preschool scenario.
8. Educators Use Language for Reasoning	"Consistently... interactive, and stimulating exchanges."	**4**	Stimulating and interactive exchanges naturally include the use of language to develop reasoning skills, such as discussing logical relationships and problem-solving.
9. Educators Listen Attentively	"Consistently positive, warm, loving, interactive..."	**4**	Warm, loving, and interactive exchanges are predicated on educators listening attentively, providing undivided attention, and making eye contact at the child's level.
10. Educators Speak Warmly	"Consistently positive, warm, loving..."	**4**	This characteristic directly aligns with the indicator's focus on educators using a caring voice and positive body language, avoiding harsh tones or commands.

The total PQI score is calculated by summing the scores of the 9 applicable indicators (9 indicators x 4 points each), resulting in a total of **36**. According to the "Program Quality Indicators Artificial Intelligence (PQIAI) Scoring Protocol," a score of 32 or higher for a preschool program is classified as **High Quality**. With a total score of 36, this program

eBook www.bookemon.com
rfiene@rikinstitute.com

comfortably achieves the highest possible rating for process quality. The results of the CH and PQI analyses will now be combined to form a holistic evaluation.

6.0 Synthesis and Conclusion: Validating a High-Impact Program Model

The comprehensive analysis using the Child Care and Early Education Heart Monitor (CCEEHM) framework provides a clear and robust validation of the proposed program model. The CCEEHM's dual-lens approach is uniquely suited to validate such a model, proving quantitatively (via the CH score) that the program is structurally sound, and qualitatively (via the PQI score) that it is developmentally rich. The structural assessment yielded a Contact Hour (CH) score of 20, confirming full compliance, while the process assessment resulted in a Program Quality Indicator (PQI) score of 36, earning a definitive "High Quality" rating.

The synthesis of these results confirms the overall effectiveness of this innovative model. The CCEEHM framework validates that a program prioritizing a higher number of highly qualified staff over longer operational hours can serve as an exemplar of high-quality early childhood education. This analysis powerfully demonstrates the CCEEHM's utility as an Integrated Program Monitoring System capable of providing a nuanced, data-driven assessment. It successfully captures both the foundational safety (structural) and the developmental richness (process) of a program, allowing for a more accurate and holistic understanding of true quality.

eBook
www.bookemon.com
rfiene@rikinstitute.com

Dr. Richard Fiene: A Profile of Innovation in Regulatory Science and Child Care Research

Introduction: Pioneering a Unified Approach to Child Care Quality

For decades, the field of Child Care and Early Education (CCEE) has operated with a fundamental schism in its approach to quality assessment. The evaluation of *structural quality*—the tangible health and safety regulations—has been fundamentally disconnected from the assessment of *process quality*, the nuanced, interactional "heart" of a program where child development truly flourishes. This separation has persistently created an incomplete picture of program effectiveness. Dr. Richard Fiene, an esteemed international researcher and research psychologist, has dedicated his career to resolving this intellectual and practical challenge.

The culmination of this focused effort is the Child Care and Early Education Heart Monitor (CCEEHM), a groundbreaking software application representing a paradigm shift in regulatory science. It offers a unified, integrated system for assessing both facets of quality simultaneously, promising a more holistic, efficient, and accurate understanding of a program's impact. This profile will explore Dr. Fiene's distinguished career, delve into his core theoretical contributions, examine the mechanics of the CCEEHM as the resolution to his career-long inquiry, and illuminate his lasting impact on the field of child welfare.

1. The Architect of Modern Child Care Regulation: A Career Overview

To fully appreciate the significance of Dr. Fiene's contributions, it is essential to understand the professional journey and foundational theories that have shaped his work. His career, spanning academia, governmental service, and international consultation, provided the rich, cross-sector experience necessary to tackle the complex challenges of child care regulation and quality improvement.

eBook
www.bookemon.com

rfiene@rikinstitute.com

1.1. Professional Trajectory and Influence

Dr. Fiene's career is marked by leadership roles across multiple domains, each informing his comprehensive approach to research and policy.

- **Academia:** He served as a professor of psychology and human development at the Pennsylvania State University. At Penn State Harrisburg, he was Department Head for both the psychology and human development programs. He is currently a senior research psychologist affiliated with the Edna Bennett Pierce Prevention Research Center at Penn State.
- **Governmental Service:** Dr. Fiene held the critical role of research director for the Commonwealth of Pennsylvania's Office of Children, Youth, and Families and the Office of Licensing and Regulatory Administration, placing him at the intersection of policy creation and practical implementation.
- **National and International Consultation:** His expertise has been sought at the highest levels, where he has served as a senior research consultant to the National Association for Regulatory Administration (NARA), the federal Office of Child Care, and the Federal Department of Health and Human Services.

1.2. Foundational Contributions to Regulatory Science

Perhaps Dr. Fiene's most impactful theoretical contribution is his "regulatory compliance law of diminishing returns." This principle fundamentally altered the approach to human services licensing by demonstrating that striving for 100% compliance with all regulations was not the most effective or efficient path to ensuring quality.

This theory led to a crucial policy evolution, shifting the goal from perfect compliance to "substantial regulatory compliance." This allowed regulatory bodies to focus resources on the most critical health and safety indicators, enabling the development of more targeted and abbreviated inspection methodologies. As noted in his biography:

This was a basic licensing and public policy paradigm shift which has impacted regulatory administration.

1.3. A Legacy of Recognition

Dr. Fiene's transformative work has been widely recognized by his peers and leading organizations in the field. His awards and honors underscore the depth and breadth of his influence.

eBook
www.bookemon.com
rfiene@rikinstitute.com

1. **Early Childhood Exchange Leadership Initiative (2019):** An election that acknowledged his significant leadership and innovative thinking within the CCEE community.
2. **Distinguished Career Award from the Pennsylvania Association for the Education of Young Children (2020):** This award honored the long-term impact of his professional career on the education and well-being of young children in Pennsylvania.
3. **Recognized Project of the Child Impact Initiative of the World Forum Foundation (2023):** This international recognition highlighted the global significance of his Key Indicator methodology for assessing and improving program quality.

This distinguished and multifaceted career provided the ideal foundation for Dr. Fiene's most recent innovation: the Child Care and Early Education Heart Monitor.

2. The Child Care and Early Education Heart Monitor (CCEEHM): A Synthesis of Experience

The Child Care and Early Education Heart Monitor (CCEEHM) is not merely a new tool; it is the practical embodiment of Dr. Fiene's career-long effort to solve the theoretical problem of integrating structural and process quality. It stands as a direct solution to one of the most persistent measurement challenges in the CCEE field.

2.1. The Central Challenge: Bridging the Quality Divide

Historically, assessing the quality of a child care program involved two separate streams of evaluation:

- **Structural Quality:** This encompasses the tangible, rule-based aspects of a program, such as staff-child ratios, group sizes, and fundamental health and safety regulations. These are the foundational elements that keep children safe.
- **Process Quality:** This refers to the interactional "heart" of quality—the dynamic and nuanced exchanges between staff and children. It is in these interactions that meaningful learning and development occur.

These two dimensions have traditionally been measured with distinct tools by different assessors (e.g., licensing inspectors for structure, quality observers for process). This separation creates an incomplete picture, failing to capture how structural elements directly support or hinder the process quality that is crucial for child development.

eBook
www.bookemon.com
rfiene@rikinstitute.com

2.2. The CCEEHM Solution: An Integrated Monitoring System

The CCEEHM is an "Integrated Program Monitoring System's Approach" delivered as a user-friendly software application (App). Its primary function is to unify the assessment of structural and process quality into a single, cost-effective, and efficient platform. It is built upon two of Dr. Fiene's established methodologies: the **Contact Hour (CH) metric** and the **Key Indicator Methodology (KIM)**. More significantly, the CCEEHM represents a grand synthesis, drawing its indicators from a wide range of previously siloed domains, including "licensing, regulatory compliance, quality rating and improvement systems, and other quality initiatives, such as accreditation, and professional development and technical assistance systems."

2.3. The Structural Foundation: The Contact Hour (CH) Metric

The CCEEHM uses the Contact Hour (CH) metric as a more effective and dynamic way to measure compliance with adult-child ratios and group size regulations. Instead of a simple snapshot, it analyzes the flow of children and staff over the course of a day. Data for the CH metric is gathered by asking six core questions for each classroom:

1. When does your first teaching staff arrive or when does your facility open?
2. When does your last teaching staff leave or when does your facility close?
3. Number of teaching/caregiving staff?
4. Number of children on your maximum enrollment day?
5. When does your last child arrive?
6. When does your first child leave?

The answers to these questions are used to construct a trapezoidal model that visualizes the density of care and determines regulatory compliance. The model's shape, which can vary from a trapezoid to a rectangle or triangle, visually represents the flow of care throughout the day, as the gradual arrival and departure of children alters its geometry.

2.4. Measuring the "Heart": Program Quality Indicators (PQI)

The process quality component of the CCEEHM is measured through Program Quality Indicators (PQI). These are observational indicators drawn from decades of key indicator studies and validated in a study in the province of Saskatchewan (Fiene, 2024). The PQI data is integrated directly into the structural model, with "summary measurements made on an hourly basis and recorded as part of the Contact Hour trapezoidal model." This provides a dynamic, relative value of quality rather than a static, absolute one. PQI

eBook
www.bookemon.com
rfiene@rikinstitute.com

measures can be scored on a 1-4 ordinal scale, similar to accreditation systems, or a 1-7 ordinal scale, similar to tools like the Environmental Rating Scales, providing a familiar metric for practitioners.

A key innovation is the integration of Artificial Intelligence (AI) to facilitate data collection. AI observers, utilizing video cameras, can conduct the thousands of observations required to populate the model. This approach enhances objectivity and makes a previously unrealistic level of detailed observation feasible. Critically, AI observers exhibit less "drift" over time compared to human observers, ensuring greater consistency and reliability in data collection.

Beyond the CCEEHM, Dr. Fiene's body of work includes numerous other foundational contributions that have advanced research and policy in the field.

3. A Broader View: Key Contributions to Child Care Research and Policy

Dr. Fiene's influence extends far beyond a single tool. His work encompasses a range of methodologies, policy frameworks, and practical resources that have reshaped how regulators, administrators, and educators approach CCEE quality. The table below summarizes his most significant contributions as detailed in his professional biography.

Contribution/Development	Description/Impact
Key Indicator Methodology & Risk Assessment	Altered regulatory science through targeted inspections and the identification of key indicators that are most crucial for keeping children healthy and safe.
Mathematical Model (Contact Hours)	Developed a mathematical model for determining adult-child ratio compliance, which now forms the structural basis of the CCEEHM.
Solution to the Child Care Trilemma	Proposed a solution to the persistent challenge of balancing quality, affordability, and accessibility in child care delivery services.

eBook
www.bookemon.com
rfiene@rikinstitute.com

Data Analysis Techniques	Developed statistical techniques, such as data dichotomization, specifically for analyzing the highly skewed, non-parametric data common in human services licensing.
National Standards and Resources	Contributed to the development of significant national resources, including 'Stepping Stones to Caring for Our Children,' 'Caring for Our Children Basics,' and the National Early Childhood Program Accreditation (NECPA).
Herding Behavior of Two-Year-Olds	Identified and described the unique group behavioral patterns of two-year-old children in care settings.
Spatial Acquisition Device & Four States of Space	Developed a theoretical construct to explain how young children acquire and understand spatial relationships.
Online Coaching Platform	Created a framework for online coaching as a targeted and individualized professional development platform for educators.
Validation Framework	Developed a formal validation framework for early childhood licensing systems and Quality Rating & Improvement Systems (QRIS).
RegalMetrics	Created a specific measurement tool used within the field of regulatory science.

These varied contributions demonstrate a career dedicated to building a stronger, more evidence-based foundation for the entire CCEE field.

4. Conclusion: An Enduring Impact on Child Welfare and Regulatory Science

Dr. Richard Fiene's work has definitively re-engineered the architecture of regulatory science in child care. His primary legacy is his success in bridging the formidable gap between theoretical research and practical application, consistently seeking to replace ambiguity with data and complexity with clarity.

eBook
www.bookemon.com
rfiene@rikinstitute.com

From the paradigm-shifting theory of diminishing returns to the integrative CCEEHM application, Dr. Fiene has provided regulators, educators, and policymakers with more efficient, effective, and data-driven tools. By resolving the long-standing division between structural safety and process quality, he has made a profound and lasting contribution to creating healthier, safer, and more enriching environments for children in out-of-home care settings.

eBook
www.bookemon.com

rfiene@rikinstitute.com

Understanding the Contact Hour (CH) Metric: A Step-by-Step Guide

1. Introduction: A Smarter Way to Ensure Quality Care

1.1. The 'Why': The Importance of Ratios and Group Size

A critical part of ensuring children's health and safety in child care programs is maintaining high "structural quality." This foundation of quality care is built upon clear rules and regulations, especially those governing adult-child ratios (the number of children per staff member) and overall group sizes.

1.2. The Challenge: A Need for Better Measurement

Traditionally, checking if a program complies with these important rules can be inefficient. The **Contact Hour (CH) metric** was introduced as a more effective and efficient modern approach to measure and monitor compliance with these essential standards.

1.3. What is the Contact Hour (CH) Metric?

The Contact Hour (CH) metric is a single number, calculated from six simple questions, that helps determine if a program has the right number of staff for the number of children over the course of an entire day.

This powerful metric simplifies complex daily schedules into a single, understandable value. To calculate it, we must first gather some basic information about the program's operations.

---

eBook
www.bookemon.com
rfiene@rikinstitute.com

2. Step 1: Gathering the Data with Six Key Questions

2.1. Overview of the Data Collection Process

The entire CH calculation begins by asking six straightforward questions about a specific classroom's daily schedule and staffing. These questions provide all the necessary inputs for the metric.

2.2. The Six Questions

1. **Facility Opening Time (TO1):** When does your first teaching staff arrive or when does your facility open?
    a. This helps establish the start of the operational day.
2. **Facility Closing Time (TO2):** When does your last teaching staff leave or when does your facility close?
    a. This helps establish the end of the operational day.
3. **Number of Teaching Staff (TA):** How many teaching/caregiving staff are present in this classroom?
    a. This determines the number of adults available to care for children.
4. **Number of Children (NC):** What is the number of children on your maximum enrollment day?
    a. This establishes the maximum group size the staff must manage.
5. **Last Child Arrival (TH1):** When does your last child arrive?
    a. This helps determine when the classroom reaches full capacity.
6. **First Child Departure (TH2):** When does your first child leave?
    a. This helps determine when the classroom begins to empty.

With the answers to these questions in hand, you are ready to perform the calculation.

---

3. Step 2: Calculating the Contact Hour Value

3.1. Putting the Numbers to Work

The answers to the six questions provide the values for a formula that calculates the final Contact Hour metric. This formula models the flow of children and staff throughout the day.

eBook
www.bookemon.com
rfiene@rikinstitute.com

3.2. Defining the Variables for the Formula

The raw answers from Step 1 are used to define four key variables for our calculation.

Variable	Represents
NC	The total **N**umber of **C**hildren.
TA	The total number of **T**eaching **A**dults/staff.
TO	The **T**otal hours the facility is **O**pen (TO2 - TO1).
TH	The **T**otal **H**ours at full enrollment (TH2 - TH1).

3.3. The Contact Hour Formula

The exact formula used for the CH metric depends on the daily flow of children. However, this guide will focus on the formula for the "trapezoidal model," which represents the most common and likely scenario in child care: a day where children arrive and depart gradually over a period of time. This formula combines the number of children, the hours of operation, and the number of staff into one value.

CH = ((NC * (TO + TH)) / 2) / TA

A calculated CH number is meaningless on its own. To understand what it signifies, it must be compared against a standardized benchmark to determine compliance.

---

4. Step 3: Interpreting the Result - Are We in Compliance?

4.1. From a Number to an Answer

The ultimate goal of the CH metric is to determine if a program is compliant with adult-child ratio (ACR) and group size (GS) standards. This is achieved by comparing the

eBook
www.bookemon.com
rfiene@rikinstitute.com

calculated CH value to a standardized reference table, which contains the maximum allowable values.

4.2. Using the Contact Hour Conversion Table

The "Contact Hour (CH) Conversion Table" is the tool used for this comparison. It shows the maximum allowable CH value for different combinations of children and required adult-child ratios.

To use the table, follow these three simple steps:

1. **Find your Group Size:** Locate the row in the table that corresponds to the number of children (NC) in the classroom.
2. **Find your Required Ratio:** Move across that row to the column for the legally required adult-child ratio for that specific age group (e.g., 1:4, 1:10).
3. **Compare Your Numbers:** The number in that cell is the maximum allowed Contact Hour value. Your calculated CH value must be at or below this number.

4.3. The Final Verdict

The rule for determining compliance is simple and direct. The source document refers to the calculated value as "Relatively Weighted Contact Hours (RWCH)."

If your calculated RWCH value **exceeds** the value in the table, the program is considered "over ratio" or "overpopulated," meaning it is out of compliance with standards. If your value is at or below the table's value, it is in compliance.

To better understand *why* the arrival and departure times change the final number, it helps to visualize what the formula is actually modeling.

---

5. Visualizing the Concept: The Shape of a Day

5.1. More Than Just a Number

The CH formula isn't just an abstract calculation; it creates a "shape" or "density distribution" that visualizes the flow of children throughout the day. The most common

eBook www.bookemon.com
rfiene@rikinstitute.com

shape, which corresponds to the formula we used, is a **trapezoid**, representing children gradually arriving in the morning and leaving in the afternoon.

5.2. What the Shape Tells Us

The shape of this distribution provides a clear visual indicator of a program's operational model and its potential compliance status.

Scenario Shape	Description	What It Means for Compliance
Trapezoid	This is the most likely scenario, where children arrive and leave gradually over a period of time. The sides of the shape are sloped.	This typically represents a program operating in compliance with ratio and group size rules.
Rectangle	An unlikely scenario where all children arrive at the exact same time and leave at the exact same time.	This represents the most efficient model of care and is used as the **benchmark** in the Conversion Table against which other programs are measured.
Extended Hours (Wide Rectangle)	The shape is wider than the benchmark rectangle, indicating the program is open for an extended time (e.g., longer than 8 hours).	This does not necessarily mean the program is out of compliance with ratios, but it indicates a higher overall exposure time for children and staff.
Overpopulated (Tall Shape)	The shape is taller than the benchmark, happening when there are too many children for the number of available staff.	This shape is a clear visual indicator of a very high CH value and **non-compliance** with adult-child ratio and group size rules.

This visual model helps explain why a program with staggered arrivals and departures can operate just as safely as one with a more rigid schedule.

---

eBook www.bookemon.com
rfiene@rikinstitute.com

6. Conclusion: The Power of the Contact Hour

The Contact Hour (CH) metric is a powerful tool that transforms complex daily schedules and staffing patterns into a single, understandable number. Its primary benefit is enabling a more efficient and effective way to ensure child care programs are meeting the fundamental health and safety standards related to adult-child ratios and group size, ultimately promoting higher quality care for all children.

eBook
www.bookemon.com
rfiene@rikinstitute.com

The CCEE Heart Monitor: Unifying Structural and Process Quality in Early Education

---

Slide 1: Title Slide

The CCEE Heart Monitor: Unifying Structural and Process Quality in Early Education

An Integrated Program Monitoring System

Based on the research of: Richard Fiene, PhD, Research Institute for Key Indicators

Affiliation: Penn State Edna Bennett Pierce Prevention Research Center

---

Slide 2: The Challenge: A Divided View of Quality

For decades, the field of Child Care and Early Education (CCEE) has been hampered by a fragmented approach to quality assessment. This division is not merely an inconvenience; it is a critical strategic problem that leads to wasted resources, inconsistent quality improvement efforts, and a lack of reliable data for system-level decision-making. To move the field forward, we must unify these separate measurement strategies into a single, comprehensive framework.

eBook
www.bookemon.com

rfiene@rikinstitute.com

The core of this challenge lies in the traditional separation of **structural quality**—the foundational health and safety rules—from **process quality**, which captures the rich, dynamic interactions that form the very heart of a child's learning experience.

Structural Quality	Process Quality
Health and safety rules and regulations	*The "heart" of quality*
Staff-child ratios and group size	*The "dance" between adult and child*
Measured by licensing inspectors	*Measured by quality observers*

This bifurcation of quality assessment yields an incomplete and often misleading picture, undermining our ability to drive meaningful program improvement and ensure accountability.

Slide 3: The Solution: The CCEE Heart Monitor (CCEEHM)

To bridge this divide, we introduce the Child Care and Early Education Heart Monitor (CCEEHM), a novel and comprehensive solution designed to unify quality assessment. The CCEEHM represents a paradigm shift, moving away from fragmented checklists toward a cohesive, integrated system that captures the interplay between a program's structure and its soul.

The CCEEHM is defined as an "Integrated Program Monitoring System's Approach" that assesses both structural and process quality on a single, streamlined platform. Its design is guided by several core principles:

- **Unified Framework:** Integrates key elements from licensing regulations, Quality Rating and Improvement Systems (QRIS), accreditation standards, and professional development initiatives into one coherent system.
- **Solid Foundation:** Built upon two proven methodologies: the **Contact Hour (CH)** metric for structural analysis and the **Key Indicator Methodology (KIM)** for identifying the most critical markers of quality.

eBook www.bookemon.com
rfiene@rikinstitute.com

- **Accessible Technology:** Delivered as a user-friendly software application (App) that can be used by licensors, quality assessors, and program staff, with automated scoring to ensure consistency and ease of use.
- **Core Goal:** To create a monitoring system that is both cost-effective and efficient, reducing administrative burden while increasing the value of the data collected.

By combining these attributes, the CCEEHM offers a powerful new lens for viewing and understanding early education quality. The following sections will explore its foundational components in greater detail.

Slide 4: The Foundation: Re-engineering Structural Metrics with the Contact Hour (CH)

Traditional methods for monitoring structural quality, such as spot-checking adult-child ratios, provide only a static snapshot in time. This approach is often inefficient and can miss critical periods of non-compliance. The CCEEHM addresses this limitation by using a more dynamic and accurate alternative: the **Contact Hour (CH)** metric.

The CH metric is an effective and efficient measure for determining compliance with adult-child ratios and group size regulations over the course of an entire day. Instead of relying on a single observation, it constructs a complete model of staff-child interaction density. The process is simple yet powerful:

1. **Ask 6 Key Questions:** Inquire about staff/child arrival and departure times, and total numbers of staff and children in a given classroom.
2. **Construct a Model:** Use the data to build a trapezoidal model that graphically represents the density of contact between adults and children throughout the day.
3. **Determine Compliance:** Compare the program's actual model area against established thresholds derived from a reference model. This comparison, which can be visualized, provides clear insights into a program's daily operations and regulatory compliance.

This innovative metric provides a robust, data-driven foundation for structural compliance, forming the stable base upon which the richness of process quality can be layered.

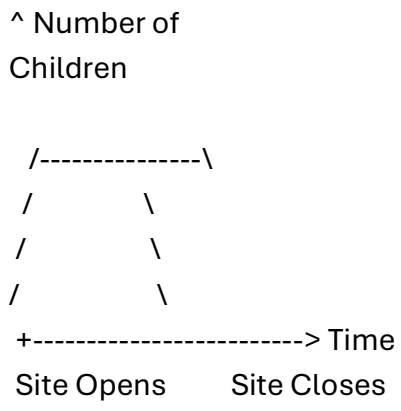
---

eBook www.bookemon.com
rfiene@rikinstitute.com

Slide 5: Visualizing Compliance: The CH Density Model

A key advantage of the Contact Hour metric is its ability to visualize compliance data, providing an intuitive and immediate understanding of a program's daily operations and potential risks. The graphical model, constructed from just six data points, paints a clear picture of staff and child density over time.

A simplified representation of this model looks like this:



The specific shape, or "density distribution," of this model reveals important information about the program's compliance and operational patterns:

- **Ideal Rectangle:** This shape, where all children arrive and leave simultaneously, represents the most efficient model. Methodologically, it serves as the crucial **computational baseline** or **reference point** against which a program's actual CH area is compared to calculate compliance.
- **Gradual Trapezoid:** The most common real-world scenario, this shape reflects the gradual arrival and departure of children and typically represents a compliant, realistic operational flow.
- **Extended Shape:** A long, stretched-out shape indicates that a facility is open for extended hours. This transforms the metric into a public health instrument, as prolonged contact can signal an increased risk of exposure when we are concerned about the spread of infectious diseases, such as with COVID-19.
- **Overpopulated Shape:** A model whose area exceeds the established compliance threshold clearly indicates non-compliance with group size and/or adult-child ratio (ACR) standards.

eBook
www.bookemon.com
rfiene@rikinstitute.com

This visualization provides a clear structural assessment. The next logical step is to move beyond simple compliance to measure the *quality* of the interactions happening within that time.

Slide 6: The Innovation: Integrating Program Quality Indicators (PQI)

Measuring structure is essential, but it is the quality of the interactions—the process—that truly defines a child's early learning experience. The CCEE Heart Monitor makes its most critical leap by integrating **Program Quality Indicators (PQI)** directly into the structural framework of the Contact Hour metric. These validated indicators are the "heart" of the system.

By integrating PQIs, the CCEEHM transforms the CH metric from an absolute value (is the program in or out of compliance?) to a more powerful relative value (what is the *holistic quality* of the child's experience within that compliant structure?). This allows an assessor to see not just *if* a program met its ratios, but to understand the *quality of the experience* children had during that time.

The 10 PQIs provide a comprehensive assessment across key domains of program excellence:

- **Staffing & Program Structure**
  - Indicator 1: Number of ECE III Educators
  - Indicator 2: Stimulating and Dynamic Environment
  - Indicator 3: Developmentally Appropriate Curriculum Based on Assessments of Each Child
- **Family Engagement & Communication**
  - Indicator 4: Opportunities for Staff and Families to Get to Know Each Other
  - Indicator 5: Formal Reporting of Child's Progress to Families
- **Observed Classroom Interactions**
  - Indicator 6: Educators Encourage Children to Communicate (Preschool)
  - Indicator 7: Infant Toddler Observation
  - Indicator 8: Educators Use Language to Develop Reasoning Skills (Preschool)
  - Indicator 9: Educators Listen Attentively

eBook
www.bookemon.com
rfiene@rikinstitute.com

- Indicator 10: Educators Speak Warmly

These indicators, drawn from decades of research, provide a validated and multi-faceted picture of what high-quality early education looks like in practice.

Slide 7: The Role of Technology: The CCEEHM App & AI

This integrated approach to monitoring, which requires sophisticated data collection and analysis, is made feasible, scalable, and objective through modern technology. The **CCEEHM App** and the proposed use of **Artificial Intelligence (AI)** are central to making this system a practical reality.

The CCEEHM App is the user-facing tool that brings the entire system to life. It guides the user through data collection for both the Contact Hour metric and the Program Quality Indicators, performing all scoring automatically. This eliminates manual calculation errors and ensures consistent application of the methodology.

Looking forward, the integration of Artificial Intelligence is poised to revolutionize the observational component of the PQIs, which has traditionally been time-consuming and subject to human inconsistency.

- **Scalability:** AI, paired with video cameras, can realistically perform the thousands of observations needed to populate the Contact Hour trapezoidal model with rich process data—a task unrealistic for human observers.
- **Objectivity:** AI helps address long-standing issues of human bias in regulatory compliance observation and decision-making, leading to fairer and more accurate assessments.
- **Reliability:** Once trained, "AI PQI Observers" will have significantly less "drift" in their scoring over time compared to human observers, ensuring greater consistency and reliability in the data.

Technology transforms the CCEEHM from a theoretical model into a powerful and practical tool ready to shape the future of CCEE monitoring.

---

eBook
www.bookemon.com
rfiene@rikinstitute.com

Slide 8: Summary of Benefits & Vision

The CCEE Heart Monitor offers a transformative solution to the long-standing challenge of fragmented quality assessment in early childhood education. By unifying structural and process metrics into a single, efficient system, it provides a clearer path forward for program administrators, quality assessors, and policymakers. The system's value is captured in its core benefits:

- **Holistic Assessment:** Provides a unified, comprehensive picture of both structural health and safety and the process quality of adult-child interactions.
- **Efficiency:** Offers a cost-effective and streamlined monitoring process through a dedicated, user-friendly App with automated scoring.
- **Data-Rich Improvement:** Moves beyond a punitive, "pass/fail" approach to a supportive, data-rich model that enables continuous quality improvement.
- **Enhanced Objectivity:** Leverages Artificial Intelligence to reduce human bias, increase reliability, and enable scalable observation.
- **Actionable Insights:** Draws on validated key indicators to provide meaningful, evidence-based data that can be used for targeted program improvement.

The CCEE Heart Monitor moves the needle from a narrow focus on structure to the heart of CCEE monitoring—process quality—providing an intersection that can elevate the entire field.

Slide 9: Questions & Contact

Q&A

For more information on this research:

Dr. Richard Fiene Research Institute for Key Indicators Data Laboratory Penn State Edna Bennett Pierce Prevention Research Center

eBook www.bookemon.com

rfiene@rikinstitute.com

Source Code for the CE2HM InfoGraphic:

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<title>Child Care and Early Education Heart Monitor (CCEEHM) Infographic</title>
<script src="https://cdn.tailwindcss.com"></script>
<script src="https://cdn.jsdelivr.net/npm/chart.js"></script>
<link rel="preconnect" href="https://fonts.googleapis.com">
<link rel="preconnect" href="https://fonts.gstatic.com" crossorigin>
<link
href="https://fonts.googleapis.com/css2?family=Inter:wght@400;600;700;900&display
=swap" rel="stylesheet">
<style>
body {
font-family: 'Inter', sans-serif;
background-color: #F0F2F5;
}
.chart-container {
position: relative;
width: 100%;
max-width: 450px;
margin-left: auto;
margin-right: auto;
height: 40vh;
max-height: 450px;
}
.pulse-line {
width: 100%;
height: 80px;
position: relative;
background: transparent;
margin: 2rem 0;
}
.pulse-line:before {
content: "";
position: absolute;
left: 0;
right: 0;
top: 50%;
height: 2px;
```


eBook
www.bookemon.com
rfiene@rikinstitute.com

```
background: #D1D5DB;
transform: translateY(-50%);
}
.pulse-line:after {
content: "";
position: absolute;
left: 0;
width: 100%;
height: 100%;
background-image: url("data:image/svg+xml,%3csvg width='100%25' height='100%25'
xmlns='http://www.w3.org/2000/svg'%3e%3crect width='100%25' height='100%25'
fill='none'/%3e%3cpath d='M0 40 L100 40 L110 50 L120 40 L130 30 L140 40 L250 40
L260 20 L270 40 L350 40' stroke='%23EF5675' stroke-width='4' stroke-
dasharray='500' stroke-dashoffset='500' fill='none'%3e%3canimate
attributeName='stroke-dashoffset' from='500' to='0' dur='2s'
repeatCount='indefinite'/%3e%3c/path%3e%3c/svg%3e");
}
</style>
</head>
<body class="text-gray-800">

<header class="bg-white shadow-md">
<div class="container mx-auto px-6 py-8 text-center">
<h1 class="text-3xl md:text-5xl font-extrabold text-[#003F5C]">The CCEE Heart
Monitor</h1>
<p class="mt-4 text-lg md:text-xl text-[#374C80]">An Integrated Program
Monitoring System for Child Care & Early Education Quality</p>
</div>
</header>

<main class="container mx-auto px-6 py-12">
<section class="text-center">
<h2 class="text-2xl md:text-3xl font-bold text-[#7A5195] mb-4">Monitoring the
"Heartbeat" of Quality</h2>
<p class="max-w-3xl mx-auto text-base md:text-lg">The Child Care and Early
Education (CCEE) Heart Monitor is a unified platform providing a real-time,
comprehensive assessment of program quality. Its goal is to move beyond
fragmented monitoring and establish a single, integrated approach to assess all
essential quality elements.</p>
<div class="pulse-line"></div>
</section>
<section class="my-16">
<h2 class="text-2xl md:text-3xl font-bold text-center text-[#BC5090] mb-8">The
Foundation: Two Key Metrics</h2>
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
<div class="grid grid-cols-1 md:grid-cols-2 gap-8 max-w-5xl mx-auto">
<div class="bg-white rounded-xl shadow-lg p-8 text-center transform hover:scale-105 transition-transform duration-300">
<div class="text-5xl mb-4 text-[#FF764A]">⏱️</div>
<h3 class="text-xl font-bold text-[#003F5C] mb-2">Contact Hour (CH) Metric</h3>
<p class="text-gray-600">This metric is the fundamental measure used for structuring all monitoring activities and data collection, ensuring consistency and comparability across the board.</p>
</div>
<div class="bg-white rounded-xl shadow-lg p-8 text-center transform hover:scale-105 transition-transform duration-300">
<div class="text-5xl mb-4 text-[#FFA600]">🔑</div>
<h3 class="text-xl font-bold text-[#003F5C] mb-2">Key Indicator Methodology (KIM)</h3>
<p class="text-gray-600">A scientifically validated approach for selecting and weighting the most critical indicators of program quality and regulatory compliance, focusing on what matters most.</p>
</div>
</div>
</section>

<section class="my-16">
<h2 class="text-2xl md:text-3xl font-bold text-center text-[#EF5675] mb-2">The Quality Intersection: A Unified View</h2>
<p class="text-center max-w-3xl mx-auto mb-12">CCEEHM is unique because it integrates the two primary types of quality measures into one platform, resolving the traditional separation between them and providing a holistic view of program effectiveness.</p>
<div class="flex flex-col md:flex-row items-center justify-center gap-4 md:gap-0 w-full max-w-6xl mx-auto">
<div class="w-full md:w-2/5">
<div class="bg-white rounded-xl shadow-lg p-6 border-l-8 border-[#374C80] mb-4">
<h4 class="font-bold text-lg text-[#374C80]">Structural Quality</h4>
<p class="text-sm text-gray-600 mt-1">The Framework: Regulatory standards, staff qualifications, child-to-staff ratios, group size, and physical environment. Assessed via Licensing & Compliance data.</p>
</div>
</div>
<div class="text-5xl text-[#7A5195] font-black transform md:-rotate-90 my-4 md:my-0 mx-8">+</div>
<div class="w-full md:w-2/5">
<div class="bg-white rounded-xl shadow-lg p-6 border-l-8 border-[#BC5090] mb-4">
<h4 class="font-bold text-lg text-[#BC5090]">Process Quality</h4>
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
<p class="text-sm text-gray-600 mt-1">The Interaction: Quality of adult-child interactions, curriculum, emotional and instructional support. Assessed via QRIS, Accreditation & PD data.</p>
</div>
</div>
</div>
<div class="flex justify-center mt-4">
<div class="text-4xl transform rotate-90 md:rotate-0 text-[#7A5195]">➔</div>
</div>
<div class="bg-[#003F5C] text-white rounded-xl shadow-2xl p-8 mt-4 max-w-3xl mx-auto text-center">
<h3 class="text-2xl font-bold mb-2">CCEEHM Integrated Platform</h3>
<p>One system providing a complete "heart monitor" reading of program health by combining both structural and process quality data.</p>
</div>
</section>


<section class="my-16">
<div class="grid grid-cols-1 md:grid-cols-2 gap-12 items-center">
<div class="text-center md:text-left">
<h2 class="text-2xl md:text-3xl font-bold text-[#7A5195] mb-4">Data Sources: What Feeds the Monitor?</h2>
<p>The system draws its "data blood" from various existing initiatives to create a single, reliable source of truth. By integrating these previously siloed streams, the CCEEHM can identify trends and insights that were previously invisible, providing a true 360-degree view of program quality.</p>
</div>
<div>
<div class="chart-container">
<canvas id="dataSourcesChart"></canvas>
</div>
</div>
</div>
</section>

<section class="my-16">
<h2 class="text-2xl md:text-3xl font-bold text-center text-[#BC5090] mb-8">Who Uses the CCEEHM?</h2>
<div class="grid grid-cols-1 md:grid-cols-3 gap-8 max-w-6xl mx-auto">
<div class="bg-white rounded-xl shadow-lg p-8 text-center">
<div class="text-5xl mb-4">👩‍🏫</div>
<h3 class="text-xl font-bold text-[#003F5C] mb-2">Program Staff & Directors</h3>
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
<p class="text-gray-600">For continuous self-assessment and data-informed
improvement planning.</p>
</div>
<div class="bg-white rounded-xl shadow-lg p-8 text-center">
<div class="text-5xl mb-4">📋</div>
<h3 class="text-xl font-bold text-[#003F5C] mb-2">Licensors & Regulators</h3>
<p class="text-gray-600">For efficient, data-driven compliance and targeted
monitoring decisions.</p>
</div>
<div class="bg-white rounded-xl shadow-lg p-8 text-center">
<div class="text-5xl mb-4">🔎</div>
<h3 class="text-xl font-bold text-[#003F5C] mb-2">Quality Assessors</h3>
<p class="text-gray-600">For integrated, reliable evaluation of both structural
and process components.</p>
</div>
</div>
</section>
<footer class="bg-white mt-16 rounded-t-xl shadow-inner">
<div class="container mx-auto px-6 py-12">
<h2 class="text-2xl md:text-3xl font-bold text-center text-[#003F5C] mb-8">CCEEHM
Benefits at a Glance</h2>
<div class="grid grid-cols-2 md:grid-cols-4 gap-8 text-center max-w-5xl mx-auto">
<div>
<div class="text-5xl mb-2 text-[#FF764A]">🔄</div>
<h4 class="font-bold">Unified</h4>
<p class="text-sm text-gray-600">Combines all quality data in one view.</p>
</div>
<div>
<div class="text-5xl mb-2 text-[#FFA600]">📊</div>
<h4 class="font-bold">Data-Driven</h4>
<p class="text-sm text-gray-600">Based on reliable CH and KIM methods.</p>
</div>
<div>
<div class="text-5xl mb-2 text-[#EF5675]">⚙️</div>
<h4 class="font-bold">Efficient</h4>
<p class="text-sm text-gray-600">Streamlines the entire monitoring process.</p>
</div>
<div>
<div class="text-5xl mb-2 text-[#7A5195]">💖</div>
<h4 class="font-bold">Holistic</h4>
<p class="text-sm text-gray-600">Provides a complete program health reading.</p>
</div>
</div>
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
</div>
</footer>

</main>

<script>
function wrapLabels(label, maxLength) {
if (label.length <= maxLength) {
return label;
}
const words = label.split(' ');
const lines = [];
let currentLine = '';
for (const word of words) {
if ((currentLine + ' ' + word).trim().length > maxLength) {
if (currentLine.length > 0) {
lines.push(currentLine);
}
currentLine = word;
} else {
currentLine = (currentLine + ' ' + word).trim();
}
}
if (currentLine.length > 0) {
lines.push(currentLine);
}
return lines;
}

const rawLabels = [
'Licensing & Regulatory Data',
'Quality Rating & Improvement Systems (QRIS)',
'Accreditation Standards',
'Professional Development & Technical Assistance'
];
const processedLabels = rawLabels.map(label => wrapLabels(label, 16));

const data = {
labels: processedLabels,
datasets: [{
label: 'Data Sources',
data: [35, 30, 20, 15],
backgroundColor: [
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
'#374C80',
'#7A5195',
'#BC5090',
'#EF5675'
],
borderColor: '#F0F2F5',
borderWidth: 4,
hoverOffset: 16
}]
};

const config = {
type: 'doughnut',
data: data,
options: {
responsive: true,
maintainAspectRatio: false,
plugins: {
legend: {
position: 'bottom',
labels: {
color: '#003F5C',
font: {
size: 12
},
boxWidth: 20
}
},
tooltip: {
callbacks: {
title: function(tooltipItems) {
const item = tooltipItems[0];
let label = item.chart.data.labels[item.dataIndex];
if (Array.isArray(label)) {
return label.join(' ');
} else {
return label;
}
}
},
backgroundColor: '#003F5C',
titleFont: {
size: 14
},
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
bodyFont: {
size: 12
},
padding: 12,
cornerRadius: 8
}
},
cutout: '60%'
}
};

const dataSourcesChart = new Chart(
document.getElementById('dataSourcesChart'),
config
);
</script>
</body>
</html>
```


eBook
www.bookemon.com
rfiene@rikinstitute.com

CE2HM App Source Code:

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<title>CCEE Heart Monitor App</title>
<script src="https://cdn.tailwindcss.com"></script>
<style>
@import
url('https://fonts.googleapis.com/css2?family=Inter:wght@400;500;600;700&display=
swap');
body {
font-family: 'Inter', sans-serif;
}
.tab-btn {
transition: all 0.3s ease;
}
.tab-btn.active {
border-color: #4f46e5;
background-color: #eef2ff;
color: #4f46e5;
font-weight: 600;
}
.tab-content {
display: none;
}
.tab-content.active {
display: block;
}
.info-icon {
cursor: pointer;
display: inline-flex;
align-items: center;
justify-content: center;
width: 1.25rem;
height: 1.25rem;
border-radius: 50%;
background-color: #e0e7ff;
color: #4f46e5;
font-weight: bold;
font-size: 0.8rem;
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
margin-left: 0.5rem;
}
.tooltip {
visibility: hidden;
width: 220px;
background-color: #333;
color: #fff;
text-align: center;
border-radius: 6px;
padding: 5px 10px;
position: absolute;
z-index: 1;
bottom: 125%;
left: 50%;
margin-left: -110px;
opacity: 0;
transition: opacity 0.3s;
}
.info-icon:hover .tooltip {
visibility: visible;
opacity: 1;
}
</style>
</head>
<body class="bg-gray-50 text-gray-800">

<div class="container mx-auto p-4 md:p-8 max-w-7xl">
<header class="text-center mb-8">
<h1 class="text-4xl font-bold text-indigo-700">CCEE Heart Monitor</h1>
<p class="text-lg text-gray-600 mt-2">Integrated Program Monitoring System</p>
</header>

<!-- Tabs Navigation -->
<div class="mb-8 border-b border-gray-200">
<nav class="flex flex-wrap -mb-px" aria-label="Tabs">
<button class="tab-btn active text-gray-500 hover:text-gray-700 hover:border-
gray-300 w-full sm:w-auto text-center py-4 px-6 border-b-2 font-medium text-sm"
data-tab="ch-metric">
1. Contact Hour (CH) Metric
</button>
<button class="tab-btn text-gray-500 hover:text-gray-700 hover:border-gray-300 w-
full sm:w-auto text-center py-4 px-6 border-b-2 font-medium text-sm" data-
tab="pqi">
2. Program Quality Indicators (PQI)
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
</button>
<button class="tab-btn text-gray-500 hover:text-gray-700 hover:border-gray-300 w-full sm:w-auto text-center py-4 px-6 border-b-2 font-medium text-sm" data-tab="summary">
3. Summary Report
</button>
</nav>
</div>

<!-- Tab Content -->
<main>
<!-- Contact Hour (CH) Metric Tab -->
<div id="ch-metric" class="tab-content active">
<div class="bg-white p-6 rounded-lg shadow-md">
<h2 class="text-2xl font-semibold mb-4 text-indigo-600">Contact Hour Calculator</h2>
<div class="grid grid-cols-1 md:grid-cols-2 gap-6">
<!-- Input Form -->
<div class="space-y-4">
<div>
<label for="to1" class="block text-sm font-medium text-gray-700">1. Facility Open Time (TO1)</label>
<input type="time" id="to1" class="mt-1 block w-full rounded-md border-gray-300 shadow-sm focus:border-indigo-500 focus:ring-indigo-500 sm:text-sm">
</div>
<div>
<label for="to2" class="block text-sm font-medium text-gray-700">2. Facility Close Time (TO2)</label>
<input type="time" id="to2" class="mt-1 block w-full rounded-md border-gray-300 shadow-sm focus:border-indigo-500 focus:ring-indigo-500 sm:text-sm">
</div>
<div>
<label for="ta" class="block text-sm font-medium text-gray-700">3. Number of Teaching/Caregiving Staff (TA)</label>
<input type="number" id="ta" min="1" class="mt-1 block w-full rounded-md border-gray-300 shadow-sm focus:border-indigo-500 focus:ring-indigo-500 sm:text-sm">
</div>
<div>
<label for="nc" class="block text-sm font-medium text-gray-700">4. Number of Children (Max Enrollment Day) (NC)</label>
<input type="number" id="nc" min="1" class="mt-1 block w-full rounded-md border-gray-300 shadow-sm focus:border-indigo-500 focus:ring-indigo-500 sm:text-sm">
</div>
<div>
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
<label for="th1" class="block text-sm font-medium text-gray-700">5. Last Child
Arrives Time (TH1)</label>
<input type="time" id="th1" class="mt-1 block w-full rounded-md border-gray-300
shadow-sm focus:border-indigo-500 focus:ring-indigo-500 sm:text-sm">
</div>
<div>
<label for="th2" class="block text-sm font-medium text-gray-700">6. First Child
Leaves Time (TH2)</label>
<input type="time" id="th2" class="mt-1 block w-full rounded-md border-gray-300
shadow-sm focus:border-indigo-500 focus:ring-indigo-500 sm:text-sm">
</div>
<button id="calculate-ch" class="w-full bg-indigo-600 text-white py-2 px-4
rounded-md hover:bg-indigo-700 focus:outline-none focus:ring-2 focus:ring-offset-
2 focus:ring-indigo-500">Calculate Contact Hours</button>
</div>
<!-- Results Display -->
<div id="ch-results-container" class="bg-indigo-50 p-6 rounded-lg space-y-4">
<h3 class="text-xl font-semibold text-gray-800">Results</h3>
<div class="text-center p-4 bg-white rounded-md shadow-sm">
<p class="text-sm text-gray-500">Total Facility Hours (TO)</p>
<p id="to-result" class="text-2xl font-bold text-indigo-600">-</p>
</div>
<div class="text-center p-4 bg-white rounded-md shadow-sm">
<p class="text-sm text-gray-500">Total Hours at Full Enrollment (TH)</p>
<p id="th-result" class="text-2xl font-bold text-indigo-600">-</p>
</div>
<h4 class="font-semibold pt-4">Contact Hour (CH) Calculations:</h4>
<div class="grid grid-cols-1 sm:grid-cols-2 gap-4 text-center">
<div class="p-3 bg-white rounded-md shadow-sm">
<p class="text-sm text-gray-500 flex items-center justify-center">Trapezoid <span
class="info-icon relative">i<span class="tooltip">Most likely scenario.
((NC*(TO+TH))/2)/TA</span></span></p>
<p id="ch-trapezoid" class="text-lg font-bold text-indigo-600">-</p>
</div>
<div class="p-3 bg-white rounded-md shadow-sm">
<p class="text-sm text-gray-500 flex items-center justify-center">Rectangle <span
class="info-icon relative">i<span class="tooltip">All children arrive/leave at
same time. (NC*TO)/TA</span></span></p>
<p id="ch-rectangle" class="text-lg font-bold text-indigo-600">-</p>
</div>
<div class="p-3 bg-white rounded-md shadow-sm">
<p class="text-sm text-gray-500 flex items-center justify-center">Triangle <span
class="info-icon relative">i<span class="tooltip">Full enrollment is a single
point in time. ((NC*TO)/2)/TA</span></span></p>
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
<p id="ch-triangle" class="text-lg font-bold text-indigo-600">-</p>
</div>
<div class="p-3 bg-white rounded-md shadow-sm">
<p class="text-sm text-gray-500 flex items-center justify-center">Formula 4 <span
class="info-icon relative">i<span class="tooltip">(NC^2)/TA</span></span></p>
<p id="ch-formula4" class="text-lg font-bold text-indigo-600">-</p>
</div>
</div>
<div id="ch-warning" class="hidden mt-4 p-4 bg-red-100 text-red-700 rounded-
md"></div>
</div>
</div>
</div>
</div>

<!-- Program Quality Indicators (PQI) Tab -->
<div id="pqi" class="tab-content">
<div class="bg-white p-6 rounded-lg shadow-md space-y-6">
<h2 class="text-2xl font-semibold mb-4 text-indigo-600">PQI Assessment</h2>
<!-- PQI 1 -->
<details class="group border rounded-lg">
<summary class="p-4 cursor-pointer font-semibold flex justify-between items-
center">
Indicator 1: ECE III Educators
<span class="text-sm font-normal text-gray-500" id="pqi1-score-display">Score: -
</span>
</summary>
<div class="p-4 border-t bg-gray-50 space-y-4">
<div>
<label for="pqi1-ece3" class="block text-sm font-medium text-gray-700">Number of
ECE III Certified teaching staff</label>
<input type="number" id="pqi1-ece3" min="0" class="pqi-input mt-1 block w-full
rounded-md border-gray-300 shadow-sm">
</div>
<div>
<label for="pqi1-total" class="block text-sm font-medium text-gray-700">Total
number of teaching staff</label>
<input type="number" id="pqi1-total" min="1" class="pqi-input mt-1 block w-full
rounded-md border-gray-300 shadow-sm">
</div>
</div>
</details>
<!-- PQI 2 -->
<details class="group border rounded-lg">
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
<summary class="p-4 cursor-pointer font-semibold flex justify-between items-
center">
Indicator 2: Stimulating & Dynamic Environment
<span class="text-sm font-normal text-gray-500" id="pqi2-score-display">Score: -
</span>
</summary>
<div class="p-4 border-t bg-gray-50 grid grid-cols-1 sm:grid-cols-2 gap-4">
<label class="flex items-center"><input type="checkbox" class="pqi-input h-4 w-4
rounded border-gray-300 text-indigo-600 focus:ring-indigo-500" data-pqi="2">
<span class="ml-2 text-sm">Co-teaching is evident.</span></label>
<label class="flex items-center"><input type="checkbox" class="pqi-input h-4 w-4
rounded border-gray-300 text-indigo-600 focus:ring-indigo-500" data-pqi="2">
<span class="ml-2 text-sm">Children are viewed as competent
learners.</span></label>
<label class="flex items-center"><input type="checkbox" class="pqi-input h-4 w-4
rounded border-gray-300 text-indigo-600 focus:ring-indigo-500" data-pqi="2">
<span class="ml-2 text-sm">Authentic and meaningful materials are
used.</span></label>
<label class="flex items-center"><input type="checkbox" class="pqi-input h-4 w-4
rounded border-gray-300 text-indigo-600 focus:ring-indigo-500" data-pqi="2">
<span class="ml-2 text-sm">Children are provided with meaningful
choices.</span></label>
<label class="flex items-center"><input type="checkbox" class="pqi-input h-4 w-4
rounded border-gray-300 text-indigo-600 focus:ring-indigo-500" data-pqi="2">
<span class="ml-2 text-sm">Children's work is displayed
respectfully.</span></label>
<label class="flex items-center"><input type="checkbox" class="pqi-input h-4 w-4
rounded border-gray-300 text-indigo-600 focus:ring-indigo-500" data-pqi="2">
<span class="ml-2 text-sm">Family photos are displayed.</span></label>
<label class="flex items-center"><input type="checkbox" class="pqi-input h-4 w-4
rounded border-gray-300 text-indigo-600 focus:ring-indigo-500" data-pqi="2">
<span class="ml-2 text-sm">Documentation of learning is displayed.</span></label>
<label class="flex items-center"><input type="checkbox" class="pqi-input h-4 w-4
rounded border-gray-300 text-indigo-600 focus:ring-indigo-500" data-pqi="2">
<span class="ml-2 text-sm">Environment reflects culture and
beliefs.</span></label>
<label class="flex items-center"><input type="checkbox" class="pqi-input h-4 w-4
rounded border-gray-300 text-indigo-600 focus:ring-indigo-500" data-pqi="2">
<span class="ml-2 text-sm">Variety of books & print materials
available.</span></label>
<label class="flex items-center"><input type="checkbox" class="pqi-input h-4 w-4
rounded border-gray-300 text-indigo-600 focus:ring-indigo-500" data-pqi="2">
<span class="ml-2 text-sm">Variety of writing materials
accessible.</span></label>
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
<label class="flex items-center"><input type="checkbox" class="pqi-input h-4 w-4
rounded border-gray-300 text-indigo-600 focus:ring-indigo-500" data-pqi="2">
<span class="ml-2 text-sm">Evidence of children's interests &
projects.</span></label>
</div>
</details>
<!-- PQI 3 -->
<details class="group border rounded-lg">
<summary class="p-4 cursor-pointer font-semibold flex justify-between items-
center">
Indicator 3: Developmentally Appropriate Curriculum
<span class="text-sm font-normal text-gray-500" id="pqi3-score-display">Score: -
</span>
</summary>
<div class="p-4 border-t bg-gray-50 space-y-2">
<p class="text-sm text-gray-600">For a sample of 10 children, how many have
records showing all three key elements below?</p>
<ul class="list-disc list-inside text-xs text-gray-500 pl-4">
<li>Emergent curriculum is practiced.</li>
<li>Children and educators are co-learners.</li>
<li>Learning activities are documented, displayed, and used for planning.</li>
</ul>
<div>
<label for="pqi3-positive" class="block text-sm font-medium text-gray-700 mt-
2">Number of positive records (0-10)</label>
<input type="number" id="pqi3-positive" min="0" max="10" class="pqi-input mt-1
block w-full rounded-md border-gray-300 shadow-sm">
</div>
</div>
</details>

<!-- PQI 4 -->
<details class="group border rounded-lg">
<summary class="p-4 cursor-pointer font-semibold flex justify-between items-
center">
Indicator 4: Staff & Family Engagement
<span class="text-sm font-normal text-gray-500" id="pqi4-score-display">Score: -
</span>
</summary>
<div class="p-4 border-t bg-gray-50 space-y-4">
<label class="flex items-center"><input type="checkbox" class="pqi-input h-4 w-4
rounded border-gray-300 text-indigo-600 focus:ring-indigo-500" data-pqi="4">
<span class="ml-2 text-sm">Program provides materials/opportunities for families
that meet diverse needs.</span></label>
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
<label class="flex items-center"><input type="checkbox" class="pqi-input h-4 w-4
rounded border-gray-300 text-indigo-600 focus:ring-indigo-500" data-pqi="4">
<span class="ml-2 text-sm">Program uses multiple communication modes, including
at least one two-way mode.</span></label>
<label class="flex items-center"><input type="checkbox" class="pqi-input h-4 w-4
rounded border-gray-300 text-indigo-600 focus:ring-indigo-500" data-pqi="4">
<span class="ml-2 text-sm">Program demonstrates respect and engages in ongoing
two-way communication.</span></label>
</div>
</details>
<!-- PQI 5 -->
<details class="group border rounded-lg">
<summary class="p-4 cursor-pointer font-semibold flex justify-between items-
center">
Indicator 5: Child Progress Reporting
<span class="text-sm font-normal text-gray-500" id="pqi5-score-display">Score: -
</span>
</summary>
<div class="p-4 border-t bg-gray-50 space-y-4" id="pqi5-inputs">
<p class="text-sm font-semibold">Select the option that best describes your
program's reporting practices:</p>
<label class="flex items-start"><input type="radio" name="pqi5" value="3"
class="pqi-input mt-1 h-4 w-4 border-gray-300 text-indigo-600 focus:ring-indigo-
500"> <span class="ml-2 text-sm">Regularly scheduled (at least 2x/year) parent
conferences AND provides a written report.</span></label>
<label class="flex items-start"><input type="radio" name="pqi5" value="2"
class="pqi-input mt-1 h-4 w-4 border-gray-300 text-indigo-600 focus:ring-indigo-
500"> <span class="ml-2 text-sm">Regularly scheduled (at least 2x/year) parent
conferences, but no written report.</span></label>
<label class="flex items-start"><input type="radio" name="pqi5" value="1"
class="pqi-input mt-1 h-4 w-4 border-gray-300 text-indigo-600 focus:ring-indigo-
500"> <span class="ml-2 text-sm">Provides a written report, but no regularly
scheduled conferences.</span></label>
<label class="flex items-start"><input type="radio" name="pqi5" value="0"
class="pqi-input mt-1 h-4 w-4 border-gray-300 text-indigo-600 focus:ring-indigo-
500"> <span class="ml-2 text-sm">None of the above.</span></label>
<hr>
<label class="flex items-start"><input type="checkbox" id="pqi5-cultural"
class="pqi-input mt-1 h-4 w-4 rounded border-gray-300 text-indigo-600 focus:ring-
indigo-500"> <span class="ml-2 text-sm">All interactions are done in a culturally
and linguistically appropriate way. (+1 point)</span></label>
</div>
</details>
<!-- Other PQIs are simplified for this app -->
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
<div class="text-center p-4 bg-gray-100 rounded-lg">
<p class="text-gray-600 font-medium">Indicators 6-10 are observational.</p>
<p class="text-sm text-gray-500">Please enter the final scores (1-4) for each
based on your observations.</p>
</div>

<div class="grid grid-cols-1 md:grid-cols-2 lg:grid-cols-5 gap-4">
<div>
<label for="pqi6-score" class="block text-sm font-medium text-gray-700">PQI 6:
Encouraging Communication</label>
<input type="number" id="pqi6-score" min="1" max="4" class="pqi-input mt-1 block
w-full rounded-md border-gray-300 shadow-sm">
</div>
<div>
<label for="pqi7-score" class="block text-sm font-medium text-gray-700">PQI 7:
Infant/Toddler Observation</label>
<input type="number" id="pqi7-score" min="1" max="4" class="pqi-input mt-1 block
w-full rounded-md border-gray-300 shadow-sm">
</div>
<div>
<label for="pqi8-score" class="block text-sm font-medium text-gray-700">PQI 8:
Fostering Reasoning</label>
<input type="number" id="pqi8-score" min="1" max="4" class="pqi-input mt-1 block
w-full rounded-md border-gray-300 shadow-sm">
</div>
<div>
<label for="pqi9-score" class="block text-sm font-medium text-gray-700">PQI 9:
Educators' Positive Attitude</label>
<input type="number" id="pqi9-score" min="1" max="4" class="pqi-input mt-1 block
w-full rounded-md border-gray-300 shadow-sm">
</div>
<div>
<label for="pqi10-score" class="block text-sm font-medium text-gray-700">PQI 10:
Educators' Warm Speech</label>
<input type="number" id="pqi10-score" min="1" max="4" class="pqi-input mt-1 block
w-full rounded-md border-gray-300 shadow-sm">
</div>
</div>

</div>
</div>

<!-- Summary Tab -->
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
<div id="summary" class="tab-content">
<div class="bg-white p-6 rounded-lg shadow-md">
<h2 class="text-2xl font-semibold mb-6 text-indigo-600">Summary Report</h2>
<div class="space-y-8">
<!-- PQI Score Summary -->
<div>
<h3 class="text-xl font-semibold text-gray-800 mb-4">Program Quality Indicators
(PQI) Summary</h3>
<div class="p-4 bg-gray-50 rounded-lg">
<div class="flex justify-between items-center">
<span class="font-medium text-gray-700">Total PQI Score:</span>
<span id="summary-pqi-total" class="text-2xl font-bold text-indigo-600">-</span>
</div>
<div class="mt-4">
<label for="program-type" class="block text-sm font-medium text-gray-700">Select
Program Type:</label>
<select id="program-type" class="pqi-input mt-1 block w-full pl-3 pr-10 py-2
text-base border-gray-300 focus:outline-none focus:ring-indigo-500 focus:border-
indigo-500 sm:text-sm rounded-md">
<option value="mixed">Mixed Age</option>
<option value="preschool">Preschool</option>
<option value="infant">Infant-Toddler</option>
</select>
</div>
</div>
</div>

<!-- Final Quality Rating -->
<div class="text-center">
<h3 class="text-xl font-semibold text-gray-800 mb-2">Final Quality Rating</h3>
<div id="final-rating-card" class="p-6 rounded-lg transition-all duration-300 bg-
gray-100">
<p id="final-rating-level" class="text-3xl font-bold text-gray-700">Pending</p>
<p id="final-rating-desc" class="text-gray-500 mt-1">Complete the PQI assessment
to see your rating.</p>
</div>
</div>

<!-- CH Metric Summary -->
<div>
<h3 class="text-xl font-semibold text-gray-800 mb-4">Contact Hour (CH) Metric
Summary</h3>
<div id="summary-ch-results" class="p-4 bg-gray-50 rounded-lg text-center">
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
<p class="text-gray-600">Complete the CH Metric calculator on the first tab to
see results here.</p>
</div>
</div>
</div>
</div>
</div>
</main>
</div>

<script>
document.addEventListener('DOMContentLoaded', function () {
// Tab functionality
const tabs = document.querySelectorAll('.tab-btn');
const tabContents = document.querySelectorAll('.tab-content');

tabs.forEach(tab => {
tab.addEventListener('click', () => {
const target = document.getElementById(tab.dataset.tab);

tabs.forEach(t => t.classList.remove('active'));
tab.classList.add('active');

tabContents.forEach(c => c.classList.remove('active'));
target.classList.add('active');
});
});

// --- Contact Hour (CH) Metric Calculation ---
const calculateChBtn = document.getElementById('calculate-ch');
calculateChBtn.addEventListener('click', () => {
// Get all input values
const to1 = document.getElementById('to1').value;
const to2 = document.getElementById('to2').value;
const ta = parseFloat(document.getElementById('ta').value);
const nc = parseFloat(document.getElementById('nc').value);
const th1 = document.getElementById('th1').value;
const th2 = document.getElementById('th2').value;
const chWarning = document.getElementById('ch-warning');

// Helper to convert HH:MM to hours
const timeToHours = (time) => {
if (!time) return 0;
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
const [hours, minutes] = time.split(':').map(Number);
return hours + minutes / 60;
};

// Validate inputs
if (!to1 || !to2 || !ta || !nc || !th1 || !th2 || ta <= 0 || nc <= 0) {
chWarning.textContent = 'Please fill in all fields with valid numbers.';
chWarning.classList.remove('hidden');
return;
}
const to1Hours = timeToHours(to1);
const to2Hours = timeToHours(to2);
const th1Hours = timeToHours(th1);
const th2Hours = timeToHours(th2);

if (to2Hours <= to1Hours || th2Hours <= th1Hours) {
chWarning.textContent = 'End times must be after start times.';
chWarning.classList.remove('hidden');
return;
}
chWarning.classList.add('hidden');



// Calculate TO and TH
const TO = to2Hours - to1Hours;
const TH = th2Hours - th1Hours;

document.getElementById('to-result').textContent = TO.toFixed(2);
document.getElementById('th-result').textContent = TH.toFixed(2);

// Calculate CH formulas
const chTrapezoid = ((nc * (TO + TH)) / 2) / ta;
const chRectangle = (nc * TO) / ta;
const chTriangle = ((nc * TO) / 2) / ta;
const chFormula4 = (nc ** 2) / ta;

// Display CH results
document.getElementById('ch-trapezoid').textContent = chTrapezoid.toFixed(2);
document.getElementById('ch-rectangle').textContent = chRectangle.toFixed(2);
document.getElementById('ch-triangle').textContent = chTriangle.toFixed(2);
document.getElementById('ch-formula4').textContent = chFormula4.toFixed(2);
// Update summary tab
updateSummaryTab();
```


eBook
www.bookemon.com
rfiene@rikinstitute.com

```
});
// --- Program Quality Indicators (PQI) Calculation ---
const pqiInputs = document.querySelectorAll('.pqi-input');
pqiInputs.forEach(input => {
input.addEventListener('input', updateAllPqiScores);
input.addEventListener('change', updateAllPqiScores);
});

function updateAllPqiScores() {
calculatePqi1();
calculatePqi2();
calculatePqi3();
calculatePqi4();
calculatePqi5();
updateSummaryTab();
}

function getScoreFromPercentage(percentage) {
if (percentage >= 76) return 4;
if (percentage >= 51) return 3;
if (percentage >= 26) return 2;
if (percentage >= 0) return 1;
return 0;
}

function calculatePqi1() {
const ece3 = parseFloat(document.getElementById('pqi1-ece3').value) || 0;
const total = parseFloat(document.getElementById('pqi1-total').value) || 0;
let score = 0;
if (total > 0 && ece3 >= 0) {
const percentage = (ece3 / total) * 100;
score = getScoreFromPercentage(percentage);
}
document.getElementById('pqi1-score-display').textContent = `Score: ${score || '-
'}`;
return score;
}

function calculatePqi2() {
const checkboxes = document.querySelectorAll('[data-pqi="2"]');
const checkedCount = Array.from(checkboxes).filter(cb => cb.checked).length;
const percentage = (checkedCount / 11) * 100;
const score = getScoreFromPercentage(percentage);
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
document.getElementById('pqi2-score-display').textContent = `Score: ${score || '-
'}`;
return score;
}

function calculatePqi3() {
const positive = parseFloat(document.getElementById('pqi3-positive').value) || 0;
let score = 0;
if (positive >= 0 && positive <= 10) {
const percentage = (positive / 10) * 100;
score = getScoreFromPercentage(percentage);
}
document.getElementById('pqi3-score-display').textContent = `Score: ${score || '-
'}`;
return score;
}

function calculatePqi4() {
const checkboxes = document.querySelectorAll('[data-pqi="4"]');
const checkedCount = Array.from(checkboxes).filter(cb => cb.checked).length;
const percentage = (checkedCount / 3) * 100;
const score = getScoreFromPercentage(percentage);
document.getElementById('pqi4-score-display').textContent = `Score: ${score || '-
'}`;
return score;
}
function calculatePqi5() {
const radio = document.querySelector('input[name="pqi5"]:checked');
const cultural = document.getElementById('pqi5-cultural').checked;
let score = 0;
if (radio) {
score += parseInt(radio.value);
}
if (cultural) {
score += 1;
}
score = Math.min(score, 4); // Cap score at 4
document.getElementById('pqi5-score-display').textContent = `Score: ${score || '-
'}`;
return score;
}

function getManualPqiScore(id) {
```


eBook
www.bookemon.com
rfiene@rikinstitute.com

```
const val = parseInt(document.getElementById(id).value);
return (val >= 1 && val <= 4) ? val : 0;
}

// --- Summary Tab Update ---
function updateSummaryTab() {
// PQI Summary
const pqiScores = [
calculatePqi1(),
calculatePqi2(),
calculatePqi3(),
calculatePqi4(),
calculatePqi5(),
getManualPqiScore('pqi6-score'),
getManualPqiScore('pqi7-score'),
getManualPqiScore('pqi8-score'),
getManualPqiScore('pqi9-score'),
getManualPqiScore('pqi10-score')
];
const totalPqiScore = pqiScores.reduce((sum, score) => sum + score, 0);
document.getElementById('summary-pqi-total').textContent = totalPqiScore || '-';

// Final Rating
const programType = document.getElementById('program-type').value;
const ratingCard = document.getElementById('final-rating-card');
const ratingLevel = document.getElementById('final-rating-level');
const ratingDesc = document.getElementById('final-rating-desc');
let thresholds;
if (programType === 'mixed') {
thresholds = { high: 36, highMid: 30, midLow: 20 };
} else if (programType === 'preschool') {
thresholds = { high: 32, highMid: 26, midLow: 16 };
} else { // infant
thresholds = { high: 28, highMid: 22, midLow: 12 };
}

ratingCard.className = "p-6 rounded-lg transition-all duration-300"; // reset
styles
if (totalPqiScore >= thresholds.high) {
ratingLevel.textContent = "High Quality";
ratingDesc.textContent = `Score of ${totalPqiScore} meets the High Quality
threshold.`;
ratingCard.classList.add('bg-green-100');
```


eBook
www.bookemon.com
rfiene@rikinstitute.com

```
ratingLevel.classList.add('text-green-700');
} else if (totalPqiScore >= thresholds.highMid) {
ratingLevel.textContent = "High-Mid Quality";
ratingDesc.textContent = `Score of ${totalPqiScore} meets the High-Mid Quality
threshold.`;
ratingCard.classList.add('bg-blue-100');
ratingLevel.classList.add('text-blue-700');
} else if (totalPqiScore >= thresholds.midLow) {
ratingLevel.textContent = "Mid-Low Quality";
ratingDesc.textContent = `Score of ${totalPqiScore} meets the Mid-Low Quality
threshold.`;
ratingCard.classList.add('bg-yellow-100');
ratingLevel.classList.add('text-yellow-700');
} else if (totalPqiScore > 0) {
ratingLevel.textContent = "Low Quality";
ratingDesc.textContent = `Score of ${totalPqiScore} is in the Low Quality
range.`;
ratingCard.classList.add('bg-red-100');
ratingLevel.classList.add('text-red-700');
} else {
ratingLevel.textContent = "Pending";
ratingDesc.textContent = "Complete the PQI assessment to see your rating.";
ratingCard.classList.add('bg-gray-100');
ratingLevel.classList.add('text-gray-700');
}


// CH Summary
const chSummaryContainer = document.getElementById('summary-ch-results');
const chTrapezoidResult = document.getElementById('ch-trapezoid').textContent;
if (chTrapezoidResult !== '-') {
chSummaryContainer.innerHTML = `
<div class="grid grid-cols-2 md:grid-cols-4 gap-4 text-center">
<div>
<p class="text-sm text-gray-500">Facility Hours (TO)</p>
<p class="text-xl font-bold text-indigo-600">${document.getElementById('to-
result').textContent}</p>
</div>
<div>
<p class="text-sm text-gray-500">Full Enrollment (TH)</p>
<p class="text-xl font-bold text-indigo-600">${document.getElementById('th-
result').textContent}</p>
</div>
<div>
```


eBook www.bookemon.com
rfiene@rikinstitute.com

```
<p class="text-sm text-gray-500">Most Likely CH</p>
<p class="text-xl font-bold text-indigo-600">${chTrapezoidResult}</p>
</div>
<div>
<p class="text-sm text-gray-500">Reference CH</p>
<p class="text-xl font-bold text-indigo-600">${document.getElementById('ch-
rectangle').textContent}</p>
</div>
</div>
`;
} else {
chSummaryContainer.innerHTML = `<p class="text-gray-600">Complete the CH Metric
calculator on the first tab to see results here.</p>`;
}
}
// Initial call to set up the summary tab
updateSummaryTab();
});
</script>

</body>
</html>
```


eBook
www.bookemon.com
rfiene@rikinstitute.com