ORIGINAL RESEARCH

A Practical Approach to Integrating Communication Skills and Early Clinical Experience into the Preclinical Medical School Curriculum

Amal Shibli-Rahhal[1] ⬤ · Anthony Brenneman[2] · Megan McVancel[3] · Marcy Rosenbaum[4]

Abstract

Background Effective integration of early clinical experiences (ECE) with preclinical curricula is challenging, given the limited knowledge-base of students and the unpredictability of clinical environments. Integration of ECE with communication skills (CS) training presents an attractive opportunity since CSs apply to all types of clinical encounters and are independent of students' medical knowledge. We present an ECE program that integrates formal CS training with the realities of clinical practice.
Methods Five ECE sessions occur throughout the first year of medical school, each focusing on a specific set of CSs previously introduced in class. Students actively observe preceptors use these skills, briefly practice them, write a critical analysis on each experience, and discuss these in small groups. To identify the perceived usefulness and impact of the ECE on students' CS learning, we analyzed the critical analyses and post intervention evaluations from students and preceptors. Descriptive analyses used SAS for Windows. Thematic content analysis using constant comparison was used to review and code narrative data, and the most commonly referred to impacts, strengths, and limitations of ECE were identified.
Results Analysis of the students' critical analyses identified the following main themes: (1) integration between ECE and formal CS teaching, (2) importance of effective CS to the delivery of good patient care, and (3) adaptability of CS to specific clinical contexts. Preceptors did not perceive the program as an added burden.
Conclusions ECE with focused goals, critical analyses, and small group debriefing can be used to effectively teach and reinforce formal classroom CS training.

Keywords Communication skills · Early clinical experience · Integration · Preceptorship · Preclinical

Background

A large number of medical schools within and outside the United States (US) offer an early clinical experience (ECE) to students [1–32]. ECE programs allow medical students to

✉ Amal Shibli-Rahhal
   Amal-rahhal@uiowa.edu

1   Department of Internal Medicine, University of Iowa Carver College of Medicine, 1216H MERF, 375 Newton Rd, Iowa City, IA 52242-2600, USA

2   Physician Assistant Program, University of Iowa Carver College of Medicine, Iowa City, IA, USA

3   University of Iowa Carver College of Medicine, Iowa City, IA, USA

4   Office of Consultation and Research in Medical Education and Department of Family Medicine, University of Iowa Carver College of Medicine, Iowa City, IA, USA

spend periods of time at a clinician's office on a longitudinal basis over the course of one or more preclinical years. In the US, many ECE programs were designed to increase differentiation of medical students into primary care specialties in order to meet the increasing needs in rural and underserved areas [4–16, 18]. Other schools have approached ECE as a way to facilitate student transition through the undergraduate medical curriculum and to enhance clinical reasoning and contextualization of knowledge [10, 28, 33–36].

Regardless of its ultimate goal, for an ECE program to be truly beneficial, it should directly integrate and reinforce classroom learning. However, most of the published ECE literature does not address if and how integration between ECE and the rest of the curriculum was achieved [3, 5, 6, 10–14, 16–32]. Only a few studies report successful integration with other elements of the curriculum [1, 2] while several others describe their ECE programs as a separate activity that is added-on rather than linked to the curriculum [4, 7–9, 15]. In this setting, the integration of ECE with communication skills (CS)

⌖ Springer

instruction is of particular interest. Most preclinical curricula introduce CS learning separate from other subjects and often before clinical exposures happen, leading to the perception by students that CS learning is of lower priority. Additionally, when students eventually start their clinical rotations, they often realize that the idealistic classroom teaching of CS does not always match real practice, a discrepancy that may be difficult to reconcile at that stage [36, 37]. The integration of ECE with CS learning provides an opportunity to emphasize the central role of CS in the practice of medicine and to allow students to observe and reflect on variations between classroom teaching and real-life practice of these skills early on.

In addition to the question of curricular integration, ECE programs face major other logistic challenges including the increased practice and productivity demands on clinical faculty, which in turn decrease faculty interest and ability to precept early students in their clinics. While these ECE implementation challenges have been previously identified and described in the literature [7, 8, 15, 20, 25, 27, 38–41], there is scant literature available that provides practical solutions to addressing them.

The purpose of the current paper is to describe an ECE program at one institution that takes into consideration these common gaps in the literature. We present a practical approach to implementation of an ECE program that integrates with CS instruction and describe student and preceptor perceptions of the impact and feasibility of this program. We also provide a detailed program description to allow adaptation of our program design to other medical school curricula.

Methods

Program Description

In 2010, a revision of the 4-year undergraduate medical curriculum at the College of Medicine (COM) was undertaken and our new curriculum was launched in fall 2013. The COM curriculum now consists of three preclinical semesters followed by five clinical semesters with emphasis on horizontal and vertical integration. To that end, we were charged with the design of an ECE that reinforces material taught in the classroom while exposing students to the structure and realities of clinical practice. This paper describes our ECE experience during the first 3 years of implementation (academic years 2013–2014, 2014–2015, and 2015–2016).

During the first year of medical school, each student is paired with a physician preceptor to join in his/her clinical practice for two 2-h ECE sessions in the fall semester and three 2-h sessions in the spring semester (amounting to a maximum of 10 h throughout the academic year if a physician chooses to participate in the program during both semesters). These encounters take place throughout the healthcare campus

and at affiliated community clinical practices. Students receive Health Insurance Portability and Accountability Act (HIPAA) training during their orientation to medical school before attending their first ECE session.

ECE is one component of comprehensive CS education provided in the first year clinical skills courses (Clinical and Professional Skills I and II in the first and second semesters respectively). CS instruction during the first year of medical school focuses on information collection (the chief complaint, the history of present illness, the review of systems, and the background history), building rapport, and responding to patient emotions. These skills are introduced incrementally over the first two semesters in the order described in Table 1. For each of these topics, the same chronological pattern of activities is used. This includes introduction of the topic by a lecture, followed by observation and practice of these specific skills during an ECE session, which is followed by a facilitated experiential small group practice with a simulated patient. As a result, all the content of the CS curriculum is covered in ECE. CS are reinforced in individual interviews with simulated patients twice per semester where students receive formative feedback on their skill development and these video recorded interviews are also reviewed by the small group facilitators. End of semester observed structured clinical examinations (OSCEs) allow students to demonstrate competency in CS in order to pass the clinical skills courses. Remediation is provided to students who show deficiencies in their CS during the semester.

As stated earlier, each ECE session focuses on a specific aspect of medical interviewing in an order that parallels the introduction of these concepts through classroom activities. Each session takes place 1–4 weeks after the specific topic it covers is introduced in lectures. The first ECE session occurs within 2 weeks of the start of each semester and subsequent sessions are scheduled 4–6 weeks apart. Some of these sessions start at the beginning of clinics (i.e., at 8 A.M. or 1 P.M.), while others start in the mid-morning or mid-afternoon. Table 1 summarizes the activities covered in ECE sessions, and these activities are centered around a specific set of learning objectives that correspond to CS taught in the classroom curriculum.

During each ECE session, students observe how their preceptors use specific CS with patients, and briefly practice these skills with at least one patient. These activities are designed to have minimal impact on the clinic flow and workload of the preceptors. We do not require preceptors to observe students while practicing these skills or to discuss their findings with them, although we encourage them to do so when time allows. Preceptors and students complete a sign-off card at the end of each session to document student attendance and completion of the required activities. Patients who agree to be interviewed by students still receive their regular care (including a medical interview) from the physician.

Table 1 Description of communication skills and activities covered in early clinical experience (ECE) sessions

Session number and semester	Communication skills covered in session	Session activities	
		Observation	Practice
1 Fall	Building rapport with the patient	Observe communication skills used by preceptor to establish or maintain a relationship with patients	Interview 1 or more patients: • Engage patient in discussion about their current illness including their symptoms, worries, and concerns and the effect of their illness on their life • Use core communication skills of open questioning, listening, and feedback
2 Fall	History of present illness (HPI) and the patient perspective	Observe communication skills used by preceptor in eliciting the HPI	Perform 1 or more patient interviews focused on eliciting the HPI including patient ideas, concerns, and expectations
3 Spring	Background history (past medical history, family history, social history) and responding to patient emotions	Observe how preceptor gathers background information and how he/she identifies and responds to patients' emotions and other cues that they present (anxiety, discomfort, fear…)	Elicit the past medical history, social history, and family history from 1 or more patients
4 Spring	Review of systems (ROS)	Observe communication skills and content emphasized by preceptor in performing ROS with patients presenting with different complaints	Obtain a brief HPI and elicit a focused ROS from 1 or more patients
5 Spring	Full interview	Observe communication techniques used by preceptor throughout a complete patient interview	Perform a full patient interview, using a variety of communication skills learned during the academic year

Following each session, the students write a brief critical analysis describing their observations and experiences, the outcome achieved as a result of using communication skills, and how these insights will guide their subsequent interactions with patients. They then meet in small groups (6–7 students/group) with a faculty facilitator to share these observations and experiences. These meetings occur 1–2 weeks after the corresponding ECE activity.

Rather than asking busy preceptors to review student reflections, this task was assigned to the small group facilitators and provided the basis for shared discussion for each ECE assignment among students and the small group facilitator. During this same small group session, students further practice the communication skills emphasized in the previous ECE session with simulated patients, before moving to the next ECE session.

The student critical analyses and small group meetings were designed to compensate for the potential lack of debriefing with preceptors in clinic. We chose to schedule each meeting after the corresponding ECE session to allow students to use their interactions with real patients in ECE to identify strengths and challenges that they want to work on through simulated situations in small group.

It should be noted that the COM used a small group teaching structure for CS instruction prior to the institution of ECE. With the creation of ECE, some of these small group sessions were redesigned to debrief and reinforce the learning that occurs in the ECE sessions. While some of the details of the program changed over the 3 years in response to student and preceptor end-of-course feedback, the learning goals and methods relevant to this research have not changed.

Recruitment and Training of Clinical Preceptors

All clinicians affiliated with the University of Iowa who see patients in the outpatient setting are invited to participate via an e-mail from the COM office of curriculum. Recruitment efforts are further supported by the clinical departments and by direct invitations from clinical skills course directors to faculty. An ECE program coordinator (a part-time position within the COM office of curriculum) subsequently pairs students with interested preceptors and coordinates their schedules. Most preceptors host one student per ECE session, and a few host two students.

Several orientation options are provided for preceptors to accommodate their busy clinical schedules. Two weeks prior to the start of each semester, preceptors are invited to attend one of several in-person training sessions that are offered during lunch breaks and after-hours. Those unable to attend in person can choose to join the session via webinar or to receive 1:1 training with the course director at an alternative time. A detailed program manual is provided to the preceptors and

students prior to the start of each semester. In addition, preceptors and students receive an automated e-mail 1 week prior to each ECE session reminding them of the upcoming session goals and activities (Table 1). The logistics of orientation are organized by the ECE program coordinator and the actual orientation material is prepared and delivered by the coordinator and the clinical skills course directors.

Data Sources

We used several methods to identify the perceived usefulness and impact of the ECE experience on students' CS learning. These included critical analysis reflection papers that students completed after each ECE experience as well as post intervention evaluation surveys from students and preceptors.

Student Critical Analyses

Following each ECE session, students are asked to write a one-page critical analysis about their ECE experience. The analyses allow the students to reflect on the specific CS-related behaviors that they observed and practiced in ECE, and how this learning will affect their future practice. To make the reflection process easier, students are asked to address three questions as follows:

> What: In this section, students describe their observations during the ECE session, such as patient complaints and preceptor's use of CS.
> So what: In this section, students describe what they have learned from the experience and what new insights were gained.
> What now: In this section, students describe how they will translate what they learned into future interactions with patients.

Evaluation Surveys

Surveys evaluating the ECE program were completed by students and preceptors. The student survey is administered at the end of each semester and includes seven items that assess the ability of the students to practice clinical skills during ECE and their perceptions regarding the usefulness of ECE. Five items consist of statements to be answered on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) and two are open questions regarding the strengths and limitations of the program.

A preceptor survey consisting of a 4-item program evaluation was emailed to the preceptors at the end of the first two academic years of the program (2013–2014 and 2014–2015). One item assessed the ability of students to individually interact with patients during ECE, another item asked the preceptors to rate the likelihood they would participate in this

program again on a 5-point Likert scale (1 = very unlikely, 5 = very likely), and two items were open questions regarding the strengths and limitations of the program.

Data Analysis

All critical analyses and evaluation surveys were de-identified. Critical analysis responses were analyzed for recurring themes across all ECE sessions and all comments rather than separating what, so what, and what now responses.

Descriptive analyses of survey responses were conducted using SAS for Windows, version 9.3 (SAS Institute Inc., Cary, NC). Data are presented as percentages.

Thematic content analysis using constant comparison was used to review and code student critical analyses as well as all student and preceptor responses to open questions about the strengths and limitations of the program [42]. Three investigators (M.R., A.S.R., A.B.) reviewed a sample of student critical analyses and student and preceptor evaluation comments and independently identified codes for recurring statements and ideas within the sample. The authors compared preliminary codes, and after reaching consensus, all response data were entered into Nvivo 10 Qualitative data analysis software (QSR international, Doncaster, Vic, Au). One investigator (M.R.) then coded all comments using both the original codebook and identifying any new codes that accounted for statements not captured in the original codebook. The authors then reviewed the content generated for each code in order to identify inconsistencies within codes, potential subcategories within themes, and specific quotes that best represented each theme. Several meetings between the authors were used to reach consensus on primary themes. Salience of themes was determined based on prevalence of statements in each theme. Based on this, we identified the most commonly referred to impacts, strengths, and limitations of the ECE experience in relation to their CS learning.

This research was submitted to COM's institutional review board, which deemed it as exempt from human subject approval.

Results

Student Critical Analyses

A total of 2048 critical analyses were submitted by the students during the 3 academic years. A random sample of 305 analyses across all five ECE sessions (15% of the total) was identified (by selecting every third analysis submitted online by the students) and analyzed. Table 2 presents the main themes and representative quotes from the critical analyses.

In their critical analyses, the students consistently commented on the important role that effective communication skills play in

Table 2 Primary themes from student critical analyses and sample quotes

Theme 1: role that effective communication skills play in the delivery to good patient care (35%)

"My observations of Dr. […] has made it clear that communication skills are always necessary when interacting with patients and is an effective tool both for gathering patient information as well as building a solid physician-patient relationship."

"I felt the communication skills I used during this appointment positively impacted the effectiveness of patient care because the patient was able to comfortably describe to me what was going on and what she was worried about without feeling embarrassed."

"When interacting with patients, I believe I should ask myself on a regular basis whether I am actively employing communication skills in order to engage in dialogue with the patient."

"[…] seeing good clinicians work and then coming home to write these reflections has really allowed me to further my understanding about what motivates me to become a physician. Yes, like everyone here I want to help people, but the skills that we are asked to discover and reflect upon during these experiences show that medicine is not only a science, but also an art. There is genuine talent that is needed to show empathy, communicate effectively, and think critically all at once, and I want to be able to do all these things to perfection."

"When the doctor came in while I was still talking with her, it was clear the doctor never has gotten to see the inner struggle that I had just witnessed. While this may not hinder the doctor's job to assess risk of surgery, it just made me aware of how much a doctor can miss about a patient's struggle when he/she is just focused on the illness."

Open questions (11%)	"I learned after the first few questions of this interaction that this patient had a lengthy past medical history, and 4-5 present illnesses. With so many different aspects of her care, I would have never learned even a fraction of her history if I just asked "closed" questions. I talked with [patient] for about 25 minutes, but by asking her open questions or to "tell me more" I was able to gather information about her present illness and concerns, her past medical history and journey to her current diagnosis, and a surprising amount about her family, work, and hobbies."
Active listening (8%)	"During future patient encounters, I hope to do a better job of giving patients enough time to respond. During a couple simulated patient interviews, I have made the mistake of asking another question too soon before the patient is done responding. This makes the patient feel rushed and they may not share all the relevant information with me if they do not feel comfortable and/or if they are not given enough time to respond."
Rapport building (8%)	"This experience taught me how important establishing initial rapport with a patient really is. Without making an emotional connection and both of us sharing some of our history with each other, I doubt the patient would have felt as comfortable as he did raising the many concerns he had in this visit."
Empathy (5%)	"I gained some valuable insight about what it is like to be ill and be in [patient's] shoes. As a future clinician, I think it will be a test to remain non-judgmental and show empathy for a patient."
Signposting (5%)	"It was very inspiring to see how the physician truly seemed to care for her patients and did an excellent job making sure they felt comfortable and knew what was coming by signposting. I could tell that the patients appreciated her for that and trusted her expertise as she really included them in the decision-making process." "[The doctor] used less signposting and summary than we have been learning about in class. This may have been more helpful for his patients to understand where the interview was headed."

Theme 2: integration between ECE experiences and the classroom and small group learning (11%)

"It has been valuable to have more exposure to real clinical situations and see how the more artificial experiences we have via modules and small group sessions translate in the real world."

"I found it very beneficial how integrated the ECE was with the [classroom] skills sessions. I think that the pacing of learning communication skills to having to apply them in the ECE visit was well thought out and allowed me sufficient time between visits to see real change in my skills. Otherwise, I greatly enjoyed the opportunity of consistent patient exposure and physician shadowing."

"I felt that the ECE experience brought us back to the patient, which was appreciated. It provided a time for you to apply what you had learned up to that point and realize that you have something to show for the time you have put in studying."

"I thought it was very valuable to be exposed to the clinical setting early on. It allowed me to relate what we are learning in class to what I will be doing in the future. It always helps to see how you will be using certain aspects of the coursework and it keeps me more motivated!"

Theme 3: adaptability of communication skills to specific clinical contexts and patient needs (8%)

"What I learned from this interview, and from my visit to the clinic in general, is that there's no set way to ask a patient questions. The interview needs to be adjusted to suit every individual patient's needs."

"Currently, we are given a fairly rigid structure in terms of the patient interview process. This is fair given that we need to make sure every aspect of the interview is properly addressed and covered while meeting with patients. I have come to understand however, that our current guide towards the patient interview is more of an informative, detailed outline that prepares us to accommodate for each situation, to tailor our interview to each individual patient."

"What I learned from this interview and from my visit to the clinic in general, is that there's no set way to ask a patient questions. The interview needs to be adjusted to suit every individual patient's needs—some are more than willing to share while others need a little more work to uncover some of the concerns that aren't directly symptom-related."

"I'm also looking forward to using some of the tips that the physician gave me. He described patient interviewing as being an actor without a complete script. You go in to interview the patient and sometimes they throw you a curve ball. You have to be ready for the unpredictable to be a competent physician!"

the delivery to good patient care, and on the negative effects that poor CSs may have.

Within this general theme, students identified specific CS as being particularly helpful or important. The skills that were most commonly mentioned are the use of open-ended questions, active listening, rapport building, empathy, and signposting. Students described their personal experiences with these skills and often set learning or practice goals centered around these specific skills.

In addition, there were frequent comments on the integration between their ECE experiences and what they learned in the classroom and small group activities.

Finally, some of the students also discussed their observations of how CSs can be adapted to specific clinical contexts and patient needs.

Student Surveys

Five hundred fourteen students completed the program during its first 3 years (153 in the fall and spring semesters of 2013–2014, 177 in the fall and spring semesters of 2014–2015, 185 in fall of 2015–2016, and 179 in spring of 2015–2016). Of 1024 student surveys (students receive a survey each semester), 972 were completed with a 94.9% response rate.

Most students reported being able to actively interact with patients in ECE and the majority felt that ECE allowed them to develop their clinical skills. Table 3 presents cumulative student data for the six semesters.

A total of 1645 student comments were coded for primary themes addressed in each statement. Five recurring themes related to strengths of the ECE experience and one theme related to limitations of the experience were identified. Sample statements for each theme are presented in Table 4.

As with their critical analyses, the students' comments consistently pointed to integration of classroom learning with real practice as an important strength of the program (19% of all comments).

The second major theme in the students' comments referred to the value of interacting with real patients and of participating in the realities of clinical settings, which gave them a deeper understanding of how healthcare providers function in the clinical environment (16%).

ECE also allowed students to appreciate how seasoned clinicians adapt specific communication skills to specific contexts during patient encounters (9%).

Fourth and related to the above themes, students repeatedly stated that ECE motivated them and reminded them why they went into medicine (9%).

Finally, students viewed the opportunity to establish a relationship with a practicing clinician early in their career as particularly beneficial. The majority of students appreciated the willingness of their mentors to incorporate them into their clinical practice and to take time to teach them and to answer their questions (9%).

In terms of limitations, the main theme that emerged was related to certain subspecialty clinics that some students were assigned to, and that did not allow practice of basic clinical skills. For example, in some clinics, patient encounters consisted of highly complex or mostly follow-up visits that allowed limited opportunities for students to conduct basic medical histories.

> It would be helpful to have students in more of a general medicine setting when learning how to take a history, ROS, perform exams, etc. I had a very good experience during my ECE, but since the clinic was very specialized I feel as though I may have not gotten as much practice or gained as much understanding as I could have.

> Sometimes the assignments were not super applicable to the clinic you were in.

Preceptor Surveys

The total number of clinicians who participated in this program during the three academic years was 306, and of those 238 (77.8%) participated in more than one semester. A total of

Table 3 Student survey responses—cumulative data for academic years 2013–2014, 2014–2015, and 2015–2016

Question on survey	Number of responses (%), $N = 972$		
	Disagree/strongly disagree	Neutral	Agree/strongly agree
ECE experiences helped me understand aspects of the patient interview	19 (2.0)	72 (7.4)	881 (90.6)
ECE experiences helped me gain insight into the patient's perspective of illness and disease	13 (1.3)	77 (7.9)	882 (90.7)
ECE experiences helped me develop specific goals to work on in developing my professional skills	35 (3.6)	89 (9.2)	848 (87.2)
I was able to practice history-taking and clinical reasoning skills during my ECE visits	49 (5.0)	107 (11.0)	816 (84.0)
This ECE experience was worthwhile	22 (2.3)	52 (5.3)	898 (92.4)

Table 4 Primary themes from student and preceptor surveys and representative quotes

Sample student quotes	Sample preceptor quotes
Theme 1: integration of classroom learning with real practice	
"These experiences give students a chance to practice the basic skills we have been learning in [class] in a real environment. This helps internalize the important aspects of communication with patients and physical exam skills."	"I think this clinical experience solidifies the material presented and studied in the classroom."
"A chance to practice clinical skills we have been learning in a simulated session and allowing students to see how their classroom knowledge applies to real-world health situations."	"I thought that the gradation of experiences was helpful for students to build upon their skills and to not overwhelm them. Students seemed to enjoy the experiences and commented several times how it was helpful to tie in their classroom learning with their clinical learning."
"I was able to put my communication and physical exam skills into practice in a clinical setting. This helped me gain confidence in both skill sets and observe additional ways of performing an interview and directed physical exam."	"Gets students in the clinic and helps them make connections between what they are learning in class and what they'll use in patient care."
	"Early clinical exposure for students, bringing a reality to the material then are learning in the classroom"
Theme 2: value of interacting with real patients and of participating in the realities of clinical settings	
"One of the main strengths of this experience is that students are able to observe and participate in how medicine is practiced in a real-world setting. No amount of lectures or simulated practicing of clinical skills can substitute for witnessing these kinds of experiences."	"Contact with patients and healthcare team are motivating for the students. Contact with patients enhances learning."
"I really liked being able to observe things as they actually were in clinic as it can be subtly different from what we see simulated."	"A good way for students to get a jump start on what clinic life looks like"
"It's good to get us into the clinics, and helps us personalize the patients from the start instead of just turning them into a body with a disease."	"Exposure to real patients early in educational process- learning the skills with real patients."
"I feel that getting hands on experience with real patients is the best part. It helps me feel comfortable talking to people who are really in need and then getting comfortable with the physical exam on someone who is not a trained actor."	"Pleasant, structured, yet low stress way to introduce students to a clinical environment. Spending time with nurses and other staff also is a good exposure."
Theme 3: ability of seasoned clinicians to adapt specific communication skills to specific contexts during patient encounters	
"It showed us firsthand how clinicians interact with their patient in an efficient, yet caring manner. It showed us how we have to interact with patients in many different settings - and how to coordinate these different responsibilities."	"Getting students used to seeing patients and having them see how they would be using their skills."
"It was really nice to see how clinician is interacting with patients and learn how I could use some of the techniques I learned in the class."	"I think that seeing what they are learning really does come into play when they go into practice is very useful."
"There were many strengths in this experience, the biggest one I believe is the chance to see and learn from different physicians interacting with patients and how to use these skills yourself; this helped immensely with the patient interview."	"It is probably too early for a student to learn much medicine from this enterprise, but seeing interactions between doctors and patients is valuable. In participating in this I was reminded each time how important interpersonal interactions are as the student might choose to model some of my behavior."
"A lot of questions about what/how to bring up questions and direct the flow of the patient interview, while still allowing the patient to say everything that needs to be said, were answered just by watching a professional do it."	
Theme 4: ECE as a motivator and reminder of why they went into medicine	
"I love being in the clinic. It really helps you remember what all this learning is really for."	"The students seemed to benefit from the experience. They enjoyed getting out into the clinics and the experience seemed to provide motivation to continue to work hard academically and remind them of why they wanted to become a [clinician]."
"Having an outlet to connect the material learned in class to real-life scenarios and experiences was tremendously insightful, and it helped start building the long bridge connecting medical school to an actual career in medicine"	"Students benefit from some exposure to keep them motivated."
"I believe seeing how medicine is practiced while learning the basics helps not only to solidify what we have learned, but to provide motivation for learning."	"A welcome experience for students to see the future fruit of their labors. They have consistently seemed to enjoy the time here."
"I liked how it was a reminder of why I want to become a doctor and was relevant to what I was learning in class."	

Table 4 (continued)

Sample student quotes	Sample preceptor quotes
Theme 5: importance of establishing a relationship with a practicing clinician early in their career	
"The biggest strength was definitely the interaction with a seasoned professional. I was amazed every time I experienced my mentor interact with patients at how much better he was at it than me and how he knew so much about each patient just by looking. The ECE experience for me has been the highlight of medical school thus far."	"Great opportunity for the students and fun for the preceptors!"
"Being able to discuss the medical field with a practicing physician is valuable in determining how I want to progress as a physician."	"I really enjoy working with them so early in their career."
"My ECE experience was successful because the doctor I paired with was very open and honest about the patients and experiences she has had over the years. Overall, I felt comfortable with my mentor and enjoyed my experience."	"Gets them face time with COM clinical faculty."
"This experience was a great way to develop a professional relationship with a local physician. My mentor was a great teacher, and I feel confident that when I have questions about medical practice I can contact my mentor for advice."	"I trained at COM and I would have loved the opportunity to work with the same physician through the year, so naturally I love to participate in this teaching model."

300 preceptor surveys were sent (150 during each of the first 2 academic years) and 197 were completed, corresponding to a response rate of 65.7%. Preceptors indicated that students were able to directly interact with patients during most sessions and the majority of preceptors expressed interest in participating in ECE again. Table 5 presents cumulative preceptor data.

A total of 113 preceptor comments were coded for primary themes addressed in each statement. The preceptors' comments echoed the main themes emphasized in the students' comments (Table 4).

Preceptors perceived ECE as being especially helpful in reinforcing classroom concepts early in the students' careers.

Similarly, preceptors emphasized the benefits of experiencing the real practice of clinical medicine and felt that direct contact with patients allows students to gain perspective of their ultimate goals and to maintain motivation for their continued studies.

Preceptors generally perceived their participation in this program as a personally fulfilling experience and the majority felt that incorporation of these early students into their clinics was feasible and particularly aided by the clear and graduated expectations for student activities.

Strengths included excellent preparation and organization on the student's part. The explanations of expectations on our part were clear and precise, making it very easy to implement a good experience for the student in the busy office setting.

Regarding the limitations of ECE, the primary concerns of preceptors included appropriate and adequate scheduling and the ability to provide adequate opportunities to practice clinical skills. Like students, some preceptors noted that their specific subspecialized clinical context did not always allow for modeling or student practice of basic new patient-oriented histories.

Rotating in a Speciality Clinic can be overwhelming for an M1 student especially if the clinic day comprises complex patients for the provider. This may make it difficult for the student and provider to focus on the actual goals of the ECE program.

In terms of scheduling, many preceptors noted that having some students start their ECE sessions while they were in the midst, rather than at the beginning, of their clinic made

Table 5 Preceptor survey responses—cumulative data for academic years 2013–2014 and 2014–2015

Question on survey	Number of responses (%), $N = 197$	
How often was student able to meet with ≥ 1 patient to complete the interview/physical exam portion of ECE	≤ 1/3 sessions 5 (2.5)	≥ 2/3 sessions 192 (97.5)
How likely are you to participate as a preceptor for ECE again?	Unlikely or undecided 16 (8.1)	Likely or very likely 181 (91.9)

providing oversight and practice opportunities challenging. Some preceptors suggested making ECE sessions longer or more frequent.

It's difficult to have new students show up at odd hours during clinic. 10 am and 2 pm are not great times to stop and talk to a student. They should start when the preceptor's clinic starts.

Discussion and Conclusion

Discussion

We have successfully implemented an ECE that allows first year medical students to apply skills learned in the classroom to real-life clinical situations. By setting goals for each ECE session that directly correspond to classroom activities, we achieved a degree of integration that allowed the students to derive an immediate benefit from ECE, a strength that was equally appreciated by students and preceptors. This sets our program apart from many other ECE programs that do not deliberately link the clinical experience to specific curricular elements and instead allow integration to happen somewhat naturally, yet unpredictably [4, 7–9, 15].

By focusing ECE on CS, we allow our students to experience the "real-life" approach to patient interviewing while still learning and practicing the ideal approach in formal teaching sessions. This deliberate choice aims to bridge the gap between the realities of clinical practice and the ideal environment of classroom teaching, which is often a source of anxiety and tension when students transition from preclinical years to clinical clerkships [33, 36, 37, 43–46]. Our analysis of student comments suggests that most were able to perceive the differences between real clinical practice and simulated settings and to appreciate the need to adapt skills learned in the classroom to the clinical context.

In designing this program, we were mindful of the limited availability and over-commitment of our clinical faculty and we did not want the placement of novice first year students in clinics to present an added burden. For that reason, we created short ECE sessions, focused each session on a limited number of skills, and divided the session activities between practice and active observation. Additionally, we did not require the clinical preceptors to provide direct teaching to the students and we compensated for this shortcoming through student critical analyses and small group debriefs. Our data suggest that this structure allowed most preceptors to meet the goals of ECE and to make these sessions helpful and meaningful. Additionally, preceptor comments suggest that most of them enjoyed this experience and did not perceive it as

a burden. Although most of these ECE challenges have been previously identified and described [7, 8, 15, 20, 25, 27, 38–41], this paper adds to the literature by describing a practical and successful approach to these challenges.

We initially planned to limit ECE to generalist practices, in order to provide the students with exposure to a wide range of medical problems. However, we could not achieve this goal due to the limited number of generalists and the lack of flexibility in the student schedule that allowed ECE to occur only on certain days of the week. As a result, we have had to place students in certain subspecialty clinics that provide a limited exposure to common medical problems. To address this limitation, we assign each student to a generalist for at least 1 semester.

Another major implementation challenge is the time and effort required from the ECE program staff to recruit and train faculty, to coordinate ECE content with other classroom activities, and to manage the students' and clinicians' schedules. To that end, an ECE program coordinator has been hired to coordinate ECE, and to work closely with course directors, with course coordinators, and with the preceptors' and their assistants.

Additional challenges that should be considered when implementing such a program include the ease of student access to clinical sites, and the maintenance of a reasonable learner time commitment. During the first year, we used clinical sites that were up to 1.5-h drive from the COM, which created scheduling difficulties and inconveniences to students. Since then, we have focused on using clinical sites in close proximity to the COM to limit travel time (0–30 min). The CS instruction curriculum was restructured to avoid increasing time demands on the learners as we transitioned to the new curriculum. One of the main changes that were implemented was to replace some of the 1:1 interviews with simulated patients with small group interviews (6–7 students taking turns interviewing a simulated patient), which allowed us to shift some of the time and cost of the program to ECE. This approach has proven more efficient than, and as effective as the 1:1 interviews but a full description is beyond the scope of this paper.

The main limitation of this study lies in the absence of direct observation of student performance and the absence of behavioral outcome data to evaluate the impact of this program on students' actual communication skills. This analysis would have required an objective measure, such as OSCEs, and randomization of students to ECE or no ECE in order to control for all other aspects of the curriculum, which was not the COM's preferred approach. Therefore, we chose to use the students' perceptions of how ECE has impacted their CS as a surrogate measure and our analysis is reassuring in that the students did perceive and appreciate the curricular integration that we intended.

Conclusion

In summary, despite several practical and logistical challenges, it is possible to create an effective and successful ECE program that is well integrated with the rest of the curriculum. We are currently focusing our efforts on increasing generalist experiences and finding ways to increase the number of these experiences without impeding clinical workflow and efficiency.

Future research may benefit from an analysis of the variability in student responses across ECE assignments and over time, and from a comparison of student responses and performance on OSCE by their assigned ECE clinical discipline.

Authors' Contributions ASR performed the descriptive analyses. ASR, AB, and MR performed the qualitative analyses. All authors contributed to the editing of the manuscript, and read and approved the final manuscript.

Availability of Data and Material The datasets generated and/or analyzed during the current study are not publicly available because they contain protected student information and curricular content, but are available from the corresponding author on reasonable request.

Compliance with Ethical Standards

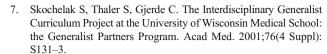**Conflict of Interest** The authors declare that they have no competing interests.

Ethics Approval and Consent to Participate This research was submitted to the University of Iowa institutional review board, which deemed it as exempt from human subject approval.

Informed Consent NA

Abbreviations *COM,* College of Medicine; *CS,* Communication skills; *ECE,* Early clinical experience; *HPI,* History of present illness; *ROS,* Review of systems; *US,* United States

References

1. Petek Šter M. Teaching communication at the medical school in Ljubljana. Acta Med Acad. 2012;41:38–46.
2. Galinsky D, Cohen R, Schneirman C, Gelper Y, Nir Z. A programme in undergraduate geriatric education: the Beer Sheva experiment. Med Educ. 1983;17:100–4.
3. Ottenheijm RP, Zwietering PJ, Scherpbie AJ, Metsemakers JF. Early student-patient contacts in general practice: an approach based on educational principles. Med Teach. 2008;30:802–8.
4. Blumenthal DS, McNeal-Steele MS, Bullard LL, Daniel SL, Satcher D. Introducing preclinical students to primary care through a community preceptorship program. J Med Educ. 1983;58:179–85.
5. Kaufman A, Mennin S, Waterman R, Duban S, Hansbarger C, Silverblatt H, et al. The New Mexico experiment: educational innovation and institutional change. Acad Med. 1989;64:285–94.
6. Rooks L, Watson RT, Harris JO. A primary care preceptorship for first-year medical students coordinated by an Area Health Education Center program: a six-year review. Acad Med. 2001;76:489–92.
7. Skochelak S, Thaler S, Gjerde C. The Interdisciplinary Generalist Curriculum Project at the University of Wisconsin Medical School: the Generalist Partners Program. Acad Med. 2001;76(4 Suppl): S131–3.
8. Steele D, Susman J, McCurdy F, O'Dell D, Paulman P, Stott J. The Interdisciplinary Generalist Project at the University of Nebraska Medical Center. Acad Med. 2001;76(4 Suppl):S121–6.
9. Steele DJ, Susman JL. Integrated clinical experience: University of Nebraska Medical Center. Acad Med. 1998;73:41–7.
10. Carney PA, Bar-on ME, Grayson MS, Klein M, Cochran N, Eliassen MS, et al. The impact of early clinical training in medical education: a multi-institutional assessment. Acad Med. 1999;74(1 Suppl):S59–66.
11. Matson CC, Ullian JA, Boisaubin EV. Integrating early clinical experience curricula at two medical schools: lessons learned from the Robert Wood Johnson Foundation's Generalist Physician Initiative. Acad Med. 1999 Jan;74(1 Suppl):S53–8.
12. Matson C, Ullian JA, Hubbard T. The Interdisciplinary Generalist Curriculum Project at Eastern Virginia Medical School. Acad Med. 2001;76(4 Suppl):S93–6.
13. Crump WJ, Chambers DL, Bolt J. Initial community site development for first–and second-year medical students. Fam Med. 1996;28:634–9.
14. Crump WJ, Boisaubin E, Camp L. The community continuity experience: generalist training for preclinical medical students. Tex Med. 1998;94:58–63.
15. Freeman J, Cash C, Yonke A, Roe B, Foley R. A longitudinal primary care program in an urban public medical school: three years of experience. Acad Med. 1995;70(1 Suppl):S64–8.
16. Lesky L, Yonke A. The Interdisciplinary Generalist Curriculum Project at the University of Illinois at Chicago College of Medicine. Acad Med. 2001;76(4 Suppl):S117–20.
17. Hook KM, Pfeiffer CA. Impact of a new curriculum on medical students' interpersonal and interviewing skills. Med Educ. 2007;41: 154–9.
18. Fernald DH, Staudenmaier AC, Tressler CJ, Main DS, O'Brien-Gonzales A, Barley GE. Student perspectives on primary care preceptorships: enhancing the medical student preceptorship learning environment. Teach Learn Med. 2001;13:13–20.
19. Madray H, Pfeiffer CA, Ardolino A. Teaching patient wellness to first-year medical students: the impact on future ability to perform the history of present illness. Med Educ. 2000;34:404–8.
20. Howe A, Dagley V, Hopayian K, Lillicrap M. Patient contact in the first year of basic medical training-feasible, educational, acceptable? Med Teach. 2007;29:237–45.
21. Frank D, Handfield-Jones R, Dawson DJ, Russell R, Steinert Y, Boillat M, et al. An integrated curriculum for teaching preparatory clinical skills at a traditional medical school. Teach Learn Med. 1996;8:4–9.
22. McLean M. Sometimes we do get it right! Early clinical contact is a rewarding experience. Educ Health (Abingdon). 2004;17:42–52.
23. Hampshire AJ. Providing early clinical experience in primary care. Med Educ. 1998;32:495–501.
24. Başak O, Yaphe J, Spiegel W, Wilm S, Carelli F, Metsemakers JF. Early clinical exposure in medical curricula across Europe: an overview. Eur J Gen Pract. 2009;15:4–10.
25. Haffling AC, Håkansson A, Hagander B. Early patient contact in primary care: a new challenge. Med Educ. 2001;35:901–8.
26. Hopayian K, Howe A, Dagley V. A survey of UK medical schools' arrangements for early patient contact. Med Teach. 2007;29:806–13.
27. von Below B, Hellquist G, Rödjer S, Gunnarsson R, Björkelund C, Wahlqvist M. Medical students' and facilitators' experiences of an Early Professional Contact course: active and motivated students, strained facilitators. BMC Med Educ. 2008;8:56–66.
28. Dornan T, Littlewood S, Margolis SA, Scherpbier A, Spencer J, Ypinazar V. How can experience in clinical and community settings

contribute to early medical education? A BEME systematic review. Med Teach. 2006;28:3–18.

29. Nathanson L, Backer K, Long L. A first-year medical school pilot program for early clinical exposure. J Cancer Educ. 1987;2:107–11.

30. Kwiatkowski T, Rennie W, Fornari A, Akbar S. Medical students as EMTs: skill building, confidence and professional formation. Med Educ Online. 2014;19:24829.

31. Helmich E, Bolhuis S, Laan R, Koopmans R. Early clinical experience: do students learn what we expect? Med Educ. 2011;45:731–40.

32. Hannay D, Mitchell C, Chung MC. The development and evaluation of a community attachment scheme for first-year medical students. Med Teach. 2003;25:161–6.

33. Dornan T, Bundy C. What can experience add to early medical education? Consensus survey. BMJ. 2004;329:834–9.

34. Diemers AD, Dolmans DH, Verwijnen MG, Heineman E, Scherpbier AJ. Students' opinions about the effects of preclinical patient contacts on their learning. Adv Health Sci Educ Theory Pract. 2008;13:633–47.

35. Yardley S, Littlewood S, Margolis SA, Scherpbier A, Spencer J, Ypinazar V, et al. What has changed in the evidence for early experience? Update of a BEME systematic review. Med Teach. 2010;32: 740–6.

36. Malhotra A, Gregory I, Darvill E, Goble E, Pryce-Roberts A, Lundberg K, et al. Mind the gap: learners' perspectives on what they learn in communication compared to how they and others behave in the real world. Patient Educ Couns. 2009;76:385–90.

37. Rosenbaum MR. Dis-integration of communication in healthcare education: workplace learning challenges and opportunities. Patient Educ Couns. 2017;11:2054–61.

38. Gray J, Fine B. General practitioner teaching in the community: a study of their teaching experience and interest in undergraduate teaching in the future. Br J Gen Pract. 1997;47:623–6.

39. Wilson A, Fraser R, McKinley RK, Preston-Whyte E, Wynn A. Undergraduate teaching in the community: can general practice deliver? Br J Gen Pract. 1996;46:457–60.

40. O'Brien-Gonzales A, Blavo C, Barley G, Steinkohl DC, Loeser H. What did we learn about early clinical experience? Acad Med. 2001;76(4 Suppl):S49–54.

41. Hartley S, Macfarlane F, Gantley M, Murray E. Influence on general practitioners of teaching undergraduates: qualitative study of London general practitioner teachers. BMJ. 1999;319:1168–71.

42. Crabtree BF, Miller WL. Doing qualitative research. 2nd ed. Thousand Oaks: Sage Publications; 1999.

43. Radcliffe C, Lester H. Perceived stress during undergraduate medical training: a qualitative study. Med Educ. 2003;37:32–8.

44. Alexander DA, Haldane JD. Medical education: a student perspective. Med Educ. 1979;13:336–41.

45. Firth J. Levels and sources of stress in medical students. Br Med J (Clin Res Ed). 1986;292:1177–80.

46. Pitkala KH, Mantyranta T. Professional socialization revised: medical students' own conceptions related to adoption of the future physician's role—a qualitative study. Med Teach. 2003;25:155–60.