

# What Factors Make for a Positive or Negative Clinical Learning Experience? Exploring the Perceptions of Postgraduate Medical Trainees

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## Abstract

**Objectives:** The clinical learning environment plays a critical role in medical education. In order to maximize the success of clinical placements, much research has sought to identify features of ideal educational environments; however, the quality of a trainees' clinical learning experience can vary substantially, both across and within a given educational context. The aim of this study assess what assess factors that influence positive or negative learning experiences among postgraduate medical trainees.

**Methods:** This mixed methods cross-section study distributed an electronic survey of residents in postgraduate years 2 to 5 in a large Canadian academic teaching centre. The qualitative portion of the survey included several open-ended questions asking residents to recall and describe specific clinical learning experiences that were either positive or negative. The quantitative section included two close-ended questions, whereby residents identified up to 5 factors from a list of characteristics identified from the literature to be impactful for resident learning.

**Results:** Of a potential 682 residents, 71 (10%) responded. Content analysis of responses produced seven themes: organization, educational aspects, qualities of supervisor and staff, interpersonal team dynamics, self-worth, level of responsibility and balance between support and autonomy. Themes transcended both positive and negative experiences and aligned with quantitative factors identified by participants.

**Conclusions:** This study adds to the existing literature around factors influencing resident perceptions of positive and negative learning experiences by providing a narrative description of the context behind these appraisals.

**Keywords:** Clinical learning experiences; Postgraduate medical education; Trainee perceptions

## Introduction

Clinical rotations are a critical component of medical training and has been of interest to educators for many years. Learning within clinical contexts allows trainees to develop and apply their knowledge, skills, attitudes and competencies in authentic settings where most healthcare is actually delivered [1]. Clinical learning environments are interactive, dynamic, and highly social [2], providing trainees with the opportunity to not only apply theoretical knowledge in authentic clinical settings, but also develop various personal and professional competencies, such as teamwork, communication, and managerial skills.

Given the importance of clinical placements in the education of medical professionals, clinical educators and program developers have become interested in how to increase the quality of clinical educational environments. Research suggests that trainees' perceptions of their clinical educational environment can have a significant influence how, why, and what they learn [3]. For example, learning environments that are perceived as more positively have been shown to promote trainees' academic achievements [4-6], as well as facilitate the development of their professional identity as future healthcare providers [7-9].

Consequently, much emphasis has been placed on identifying features of positive clinical learning environments, with the ultimate goal being to maximize positive, successful learning contexts. Indeed, a variety of studies have identified various factors that influence students' satisfaction with their clinical learning environment, such as supervisor characteristics, interpersonal relationships, academic self-perceptions, and the culture of the clinical workplace [3-17]. However, it is important to differentiate between clinical learning *environments* and clinical learning *experiences*. Trainees' learning experiences can vary substantially, both across and within a given educational context, and as a result, trainees can have a negative learning experience in a positive clinical placement, and vice versa. It is therefore important to determine what constitutes a positive versus a negative learning *experience*, irrespective of how the overall clinical rotation was perceived. In light of this, the purpose of this study was to assess what factors influence positive or negative learning experiences among residents in the context of the clinical learning environment.

## Methods

### Study design and ethics

The present study used a cross-sectional, mixed methods survey design to examine residents' perceptions of their own positive and negative learning experiences [18]. In recent years, researchers have advocated for combining qualitative and quantitative research methods in order to expand the breadth and range of understanding and corroboration obtained during a scientific endeavour [19,20]. A self-administered, anonymous survey was electronically distributed by the Department of Post Graduate Medical Education to each of the residency programs at McMaster University (Canada). Informed consent for the survey was provided by reading the approved consent form and then clicking to accept entrance into the electronic survey. Participation was voluntary and participants could withdraw at any point. Ethics approval was received from McMaster University's Faculty of Health Sciences Research Ethics Board (HIREB # 15-024).

### Participants

Participants included resident physicians from McMaster University (Ontario, Canada). Inclusion criteria were any resident in a program between postgraduate year two to five. First year residents were excluded as it was felt they may not have enough clinical experiences to evaluate both positive and negative aspects.

Residents were recruited electronically via an email sent through the office of Postgraduate Medical Education at McMaster University. Individuals who agreed to participate were sent a second email containing a link to the online survey and all responses were de-linked from email addresses to ensure anonymity of respondents. As an incentive to participate in the study, all respondents were entered into a draw for one of ten \$10 gift cards in appreciation of their time.

### Questionnaire design

The survey was developed by the authors of this paper in order to

identify factors related to positive and negative learning experiences. During a review of the literature, several validated questionnaires were identified; however, many of these are quite exhaustive (e.g., >50 items) [2,21-25]. Because the survey in the present study sought to integrate both open-ended (qualitative) and close-ended (quantitative) questions, we did not want to provide participants with a survey that would be perceived as too lengthy due to concerns related to completion rates. Therefore, we created an anonymous 6-item that consisted of four open-ended questions and two close-ended questions. The survey was designed from a comprehensive review of the literature. Two postgraduate trainees and two medical educators reviewed the content and format for face validity.

The open-ended questions were developed to elicit resident narratives on positive and negative learning experiences. For positive learning experiences, residents were first provided with the prompt: "Please think of a clinical rotation that you found to be a positive learning experience", which was then followed by two open-ended questions: (a) "In your own words, please describe what made this a good rotation" and (b) "What was your most valuable learning experience during this rotation?" The same format was followed for negative experiences, with residents being prompted to "Please think of a clinical rotation that you found to be a negative learning experience", followed by two open-ended questions: (a) "In your own words, please describe what made this a negative rotation" and (b) "What was your most negative learning experience during this rotation?"

The quantitative elements of the survey provided participants with a list of 16 factors that were identified through a comprehensive literature search on characteristics that area associated with positive/negative learning experiences ([2,17,21-25]; Table 3). While some items were complementary for both positive and negative learning experiences (i.e., "learner expectations were set out early in the rotation so I knew what was expected of me" vs. "learner expectations were not clear and so I did not know what was expected of me"), this was not the case for all items. For example, while having "rotation being too short" was identified as having a negative impact on learning, there was no literature to suggest that the opposite would have a positive influence on learning. So rather than ensuring that the items included for positive and negative close-ended questions mirrored one another, which would have unnecessarily increased the number of items for each question, we focused on making sure that the items included aligned within finding in the literature. Participants were asked to identify up to 5 factors from the list that made their described learning event positive or negative.

Demographic data was also captured including gender, training year and program. Participants did not have to respond to these questions if they elected not to. These data were separated from participant responses so to maximize anonymity, particularly since some respondents were from small programs. Consequently, we were not able to link any demographic information of our participants to their survey responses.

**Data analyses**

Both descriptive quantitative and qualitative approaches were used for analyses. Qualitative content analysis was used to analyze narrative responses obtained from the open-ended questions. Content analysis refers to a number of different methods used to analyze textual information [26]; in the present study, content analysis was defined as "the subjective interpretation of the context of text data through the systematic classification process of coding and identifying themes or patterns" ([27], p. 1278). The unit of analysis was defined as an individual word, sentence or phrase found within a response [28]. Based on this definition, a single narrative could convey multiple ideas and therefore, could be coded for more than one theme. The final narrative dataset consisted of 215 data units (e.g., selected words, sentences or phrases) describing positive learning experiences and 213

data units documenting negative learning experiences. These data were thematically analyzed using the following steps.

In the first step, both authors familiarized themselves with the data by reading and rereading all written comments describing positive and negative learning experiences. In the second step, data units were extracted from the text to form separate statements. In the third step, data units were grouped based on similar content or recurrent phrases. Lastly, both authors reviewed the narratives and conducted independent content analyses to identify broad themes within the narrative data. Using a constant comparison strategy, the thematic categories were continually revisited in iterative rounds of face-to-face discussions [29]. In instances where discrepancy existed between the thematic codes, the authors discussed this until a consensus was reached.

Only two closed-ended questions were included on this questionnaire. Because participants did not have to respond to all items (e.g., did not respond Yes/No to each item), non-parametric statistical analyses could not be conducted. As such, descriptive statistics were calculated to identify the frequency with which a resident endorsed a given factor as being influential [30].

**Results**

Overall, 71 (10%) residents of the 682 possible respondents were included in the data analysis. Of the 71 participants who were included, majority were female (n=41; 58%). With regards to postgraduate year (PGY) of training, most of the respondents were from PGY 2 and 3 (n=24 (34%) and n=20 (28%), respectively). Lastly, most of the residents were in medical specialties (e.g., medicine, psychiatry, pediatrics, etc. n = 41(58%)) as opposed to surgical specialties (e.g., general surgery, obstetrics and gynecology; n=25 (35%)). Please see Table 1 for further details.

**Qualitative analyses**

The response to the open-ended questions were organized into seven themes: organization, educational aspects, qualities of supervisor and staff, interpersonal team dynamics, self-worth, level of responsibility and balance between support and autonomy. Interestingly, these themes transcended both positive and negative learning experiences. Table 2 illustrates the percentage of responses that were coded within each thematic category for both positive and negative narratives, as well as representative quotes.

**Table 1:** Overall demographic description of study participants.

<b>Gender</b>		
Male		29 (41%)
Female		41 (58%)
Prefer Not to Answer		1 (1%)
<b>Post Graduate Year (PGY)</b>		
PGY 2		24 (34%)
PGY 3		20 (28%)
PGY 4		8 (11%)
PGY 5		11 (15%)
Prefer not to answer		8 (11%)
<b>Department</b>		
Medical*		41 (58%)
Surgical**		25 (35%)
Prefer not to answer		5 (7%)
<b>Total</b>		<b>71</b>

\*Medical specialties include emergency medicine, family medicine, internal medicine, neurology, pediatrics, psychiatry, anesthesia, medical biochemistry, pathology, public health, and radiology

\*\*Surgical specialties included general surgery, neurosurgery, and obstetrics and gynecology

**Table 2:** Summary of major themes obtained from narratives of positive and negative learning experiences, along with illustrative quotes.

Positive learning experiences (n = 215)	Negative learning experiences (n = 213)
<p><b>Theme 1: Organization (n=11; 5%)</b></p> <p>“Well-organized rotation with clear objectives and goals for all participants (medical students, residents, staff, allied health care workers”</p> <p>“Well-organized, provided with a schedule and clear expectations at beginning of rotation”</p>	<p><b>Theme 1: Organization (n=33; 15%)</b></p> <p>“It was disorganized”</p> <p>“TERRIBLE [sic] planning and organization (sending most of the team to a conference and leaving 2 residents to cover a large patient load”</p> <p>“A staff member that was disorganized, felt like my time and the time of the team was wasted”</p>
<p><b>Theme 2: Educational Aspects (n=95; 44%)</b></p> <p>“A good mix of time for patient care, but also dedicated time for reading around cases and other learning”</p> <p>“Time away from service that is dedicated to resident learning”</p> <p>“Staff/supervisor who really cared about my learning, discussed with me my learning needs”</p> <p>“Having a supervisor who provided constructive feedback”</p>	<p><b>Theme 2: Educational Aspects (n=55; 26%)</b></p> <p>“Little emphasis on teaching/learning in comparison to service”</p> <p>“Some staff were not open to taking learners or reluctant to teach”</p> <p>“You were never given any positive feedback. Always negative and never in a constructive way. Was not a rotation I looked forward to working in”</p> <p>“No feedback from staff”</p>
<p><b>Theme 3: Qualities of Supervision (n=14; 7%)</b></p> <p>“Preceptor who is approachable”</p> <p>“Supportive and approachable teachers”</p> <p>“Having a good role model”</p> <p>“Working with a supervisor who was passionate about the discipline. Very inspiring”</p>	<p><b>Theme 3: Qualities of Supervision (n=26; 12%)</b></p> <p>“Supervisor punitive, uninterested intellectually in the discipline”</p> <p>“Harsh criticism from staff for decisions made by senior residents but executed by junior learners”</p> <p>“Some of the staff were crass and it make me uncomfortable. Some of the fellows seemed to just laugh anything off, even when that was totally inappropriate.”</p>
<p><b>Theme 4: Interpersonal Team Dynamics (n=27; 13%)</b></p> <p>“Collegial working environment”</p> <p>“A good rotation provides a setting where I feel part of a team and where I am value and not a burden”</p> <p>“Feeling like I was part of the team and was involved in team discussions and activities”</p>	<p><b>Theme 4: Interpersonal Team Dynamics (n=20; 9%)</b></p> <p>“Felt no support from administrative staff, negative attitudes from admin [sic] staff”</p> <p>“I didn’t feel as though I fully belonged, never having my own space in which to sit/do work outside of clinical encounters”</p> <p>“Unhealthy relationships between staff working on the unit as well as staff vs. supervisor”</p>
<p><b>Theme 5: Self Worth (n=8; 4%)</b></p> <p>“I appreciated that [my supervisor] identified gaps/areas for improvement in a non-punitive, self-esteem building manner”</p> <p>“The staff person appreciated the work I did and make me feel important and valued”</p> <p>“The staff made me feel valued, and I valued my learning experience in the rotation”</p>	<p><b>Theme 5: Self Worth (n=17; 8%)</b></p> <p>“Staff were stressed and short, sometimes yelling, sometimes ridiculing if mistakes were made”</p> <p>“Complete loss of self-esteem. I felt completely incompetent and useless. I felt completely paralyzed in the OR. It made me seriously think about sending my registration as a postgraduate trainer”</p>
<p><b>Theme 6: Balance between Support and Autonomy (n=48; 22%)</b></p> <p>“Balance of autonomy with regards to decision making and direct supervision of clinical skills”</p> <p>“Opportunities to do procedures myself, but with adequate supervision”</p> <p>“The ability to conduct interviews and examinations with independence, but oversight”</p>	<p><b>Theme 6: Balance between Support and Autonomy (n=37; 17%)</b></p> <p>“Too much autonomy early in training, high volume of patients without seemingly enough time for each”</p> <p>“Lack of support from staff or more senior personnel”</p> <p>“Felt as though I was too closely followed, even “watched”, by my supervisor</p> <p>“I was reporting to a senior resident about everything I did”</p>
<p><b>Theme 7: Level of Responsibility (n=12; 6%)</b></p> <p>“I was never left alone to deal with issues outside of my capacity, so I never felt that my involvement was a detriment to patient safety”</p> <p>“Managing a patient from intake throughout their treatment course”</p> <p>“Responsibility for patient care and follow-up, mirroring independent practice”</p>	<p><b>Theme 7: Level of Responsibility (n=25; 12%)</b></p> <p>“I was given medically ill patients to manage, beyond my comfort level or training level”</p> <p>“I didn’t feel prepared for the acute and serious medical situations I was placed in. During those situations I felt unsupported”</p> <p>“I provided woefully inadequate patient care due to the lack of manpower and support. One patient went into SSRI withdrawal when their medication was missed for over a week, extending their stay and leading to unnecessary investigations”</p>

**Theme 1: Organization of Clinical Placement** refers to responses describing the overall structure of the clinical rotation. For positive learning experiences, residents described clinical placements that were well-organized and had clearly defined expectations and learning goals. For example, in describing a positive learning experience, one respondent stated that it was ‘well

organized, [and] provided a schedule with clear expectations at the beginning of the rotation.”

In contrast, clinical placements were described as negative learning experiences when they were poorly organized and had no clear expectations or learning objectives. Within these descriptions,



residents described that such disorganization had negative implications on their ability to provide adequate patient care. For example, one resident stated that the clinical rotation that was “poorly organized with inadequate time given to see our patients”

**Theme 2: Educational Environment** encompassed experiences where participants discussed learning opportunities, or lack thereof. In the context of positive learning experiences, residents described the importance of having well-demarcated time for teaching and learning. The ability to have dedicated time for learning was often portrayed in the context of having protected time away from clinical service responsibilities. For example, in describing a positive learning experience, one resident wrote, “the rotation has lots of protected teaching and a good balance of service with education”. Relatedly, the commitment of supervisors and staff to learning and teaching played a significant role in creating positive learning experiences. Residents emphasized the importance of having supervisors and staff who “invest in your learning” and were able to “create strong learning environments”. Having staff who were highly invested in their learning provided positive motivation to learn the material, as evidenced by the following quote:

*Good staff who teach at every opportunity, they can spark my interest and make me want to read up on things rather than making me feel guilty for what I don't know*

Lastly, residents perceived the provision of timely, appropriate feedback by staff as a factor that contributed to positive learning experiences. Residents emphasized the importance of having balanced feedback that was not only positive, but also constructive in order to provide opportunities for improvement. For example, one resident described a positive learning experience as involving “feedback that was given at appropriate times, both as positive as well as constructive”.

In comparison, negative learning experiences were often linked to negligible time spent on formal teaching, with greater emphasis on clinical service as opposed to resident learning. One participant described, “when the balance of service to education heavily favored service, there was no time to read about cases or learn from them”. Another resident commented that it was difficult to learn because the rotation was an “extremely busy and high-volume rotation which was heavily serviced-based, and no time for teaching or learning. No time to read around cases, just extremely long hours with no teaching”. As with positive learning experienced, feedback also played an influential role in residents perceptions of negative learning experiences. Some residents described the complete absence of feedback as contributing to their negative experience, as demonstrated in the following quote:

*Staff chose not to focus on resident development, stating that time was too short to allow for feedback rather than focusing on what feedback could be given.*

Alternatively, other residents described feedback that was predominantly negative rather than being constructive:

*You were never given any positive feedback. Always negative and never in a constructive way. It was not a rotation I looked forward to working in*

**Theme 3: Qualities of Supervision** encompasses those narratives where participants described characteristics of their supervisors and staff that influenced their learning experiences. Positive learning experiences reflected staff who were described as “approachable”, “positive”, “kind”, “humble” and “compassionate”. Moreover, within these descriptions of positive learning experiences, residents discussed the importance of appropriate modeling behavior from their supervisor. For example, one resident described the following positive learning experience:

*Observed staff having difficult conversations (ie, breaking bad news, counselling), which was great to be able to model their behavior and language*

In contrast, negative learning experiences focused on staff who were described as “rude” and “unsupportive”. Moreover, narratives described unprofessional, and at times, bullying behaviour by staff. Descriptions of unprofessional behaviours highlighted actions that residents perceived as unethical and failing to provide patient-centered care. One such example:

*The staff physician struck me as wanting to further his academic achievements and prioritized this over the care of our patients. The staff physician seemed careless and unwilling to provide appropriate testing for patients who were being referred to specialty care, saying that the specialist would order it anyways, even though the patient's treatment could have started sooner if the testing was done in advance*

Other narratives described supervisor behavior that was disrespectful towards residents and at times, bullying in nature. Within these narratives, residents describe a variety of negative experiences with various staff members, such as “being belittled” and being the recipient of “yelling and negative comments during more stressful cases, directed at residents specifically”.

**Theme 4: Interpersonal team dynamics** reflects experiences where elements of working within a team impacted the learning experiences. Positive learning experiences reflected inclusive, cohesive and respectful interactions. When the resident was treated with “kindness and respect by the nursing and allied health staff on the rotation” the experience was perceived as positive. Such collegial working environments were thought to have positive effects on learning, as illustrated by the following quote: “Feeling part of a team made me more confident and helped me to develop strategies to improve my surgical skills”.

On the other hand, negative learning experiences were described as “non-collegial” and “unsupportive” team interactions. In defining a negative learning experience, one resident wrote of a clinical experience characterized by “dysfunctional team dynamics, with much animosity between residents, between staff, and between residents and staff”

**Theme 5: Self-worth** involved any narratives where participants commented on their sense of self. When a rotation was perceived as a positive learning experience, it often assisted in improving residents' confidence and self-esteem. As one resident stated: “Being respected and appreciated helps to improve my self-esteem”.

In contrast, negative learning experiences were often described as “shame-based” and deleteriously impacted sense of self, leaving residents feeling “useless and incompetent”. For example, one resident described the following experience:

*It was a dreadful rotation on the whole. It's the closest I've come to being clinically depressed. I wanted my bus to crash every morning so I didn't have to go into work*

In these narratives, several residents believed that such experiences had detrimental effects on learning by making them less likely to engage in learning activities, such as asking questions or challenging themselves. For example, one resident stated that “feeling small, stupid and worthless if I had a question – so I wouldn't ask questions”.

**Theme 6: Balance between Support and Autonomy** describes the extent to which residents perceived a balance between independence and support from staff and supervisors. Narratives on positive learning experiences emphasized the importance of having opportunities to make treatment and management decisions independently, while knowing they had support from staff supervisors if needed. For example, one respondent wrote that “a good mix of responsibility and support is essential”. The appropriate mix of autonomy and support

was associated with clinical skill development, as illustrated in the following quote:

*The staff supported my autonomy and fostered my own clinical competence by making me feel comfortable with my skills to allow for more autonomy with indirect supervision to further solidify, foster, and integrate my clinical competences for that particular rotation.*

In addition to promoting the development of clinical skills, supervisor-supported independence also helped residents develop confidence and encouraged self-reflection on their performance. For example, in describing a positive learning experience, one resident wrote:

*Making management decisions independently but in a supervised place made me feel confident in my skills and helped me understand areas I might have missed when making my decision.*

In contrast, narratives on negative learning experiences described situations where support and autonomy were not appropriately balanced. One the one side, several narratives described experiences where residents felt they had too many duties without adequate support. For example, a resident described their experience as “being overwhelmed with a very large number of patients to see, a pager going off all day and not able to reach my seniors or staff for help or questions”. On the other hand, some residents describe experiences where they felt overly supervised and were “not given enough responsibility”. One resident wrote of a situation where they were “being micromanaged [and] being told exactly how to do things without given the opportunity to develop my own system”.

**Theme 7: Level of responsibility** encompasses the degree to which

a trainee becomes responsible for patient care. For positive learning experiences, residents described instances where they perceived a sense of ownership over patient care, enabling them to “carry out my management plans and see the results” This perceived ownership over patient care was viewed as particularly beneficial in providing residents with insight into future professional responsibilities. For example, one resident wrote:

*The experience was pleasurable because I felt a real sense of ownership over my patients...It was one of the busiest rotations I've had thus far, but it was an excellent opportunity to experience what it would be like to be a staff and to have greater control over the management of my patients.*

Negative learning experiences reflected narratives where participants reported feeling as if they were being asked to provide patient care that was beyond their level of training. For example:

*Feeling uncomfortable with my own skills to address a patient's concerns, but not being given the time or to review these concerns and learn from my preceptor on a regular basis.*

Within these narratives, residents expressed concerns regarding the safety of their patients. One resident described a rotation with “potentially unsafe call scenarios as the responsibility I was given was above my level of confidence”

**Quantitative analyses**

Residents were asked to identify up to five factors that made their learning experience positive or negative (Table 3). Respondents could respond to more than one option, which resulted in n=295 responses

**Table 3:** Percentage of resident responses related to factors underlying positive and negative educational experience. Note that respondents could respond to more than one option and so cells represent the total number of residents that endorsed a given item.

Positive Learning Experience		Negative Learning Experience	
Item	n = 295	Item	n = 240
My learning on this rotation was valuable and transferable to my future practice.	38 (13%)	I do not feel as though I learned much.	28 (12%)
My supervisor was available and provided educational opportunities from which I took valuable learning	30 (10%)	It was difficult to engage with my supervisor.	29 (12%)
There was a balance between didactic and skills based learning.	5 (2%)	The balance was towards service versus education.	41 (17%)
The rotation was an inclusive, respectful, team- oriented environment.	34 (12%)	I did not feel like I was part of the team.	17 (7%)
I received a lot of meaningful and useful feedback from my supervisor and other members of the team	22 (7%)	I received minimal feedback throughout the rotation.	23 (10%)
The rotation was intellectually stimulating.	35 (12%)	There was minimal or no diversity in the cases seen.	6 (3%)
The rotation enhanced my confidence in my skills and abilities.	31 (11%)	I was constantly afraid that I would appear incompetent.	16 (7%)
The rotation was well organized and the clinical activities were applicable to my learning goals.	15 (5%)	The rotation was poorly organized and the clinical activities were not applicable to my future practice.	22 (9%)
Learner expectations were set out early in the rotation so I knew what was expected of me.	16 (5%)	Learner expectations were not clear and so I did not know what was expected of me.	10 (4%)
The workload associated with this rotation was particularly manageable.	10 (3%)	My workload was unmanageable.	24 (10%)
This rotation (i.e. specialty area) was particularly interesting to me.	7 (2%)	I was not interested in the rotation.	4 (2%)
I was given a lot of independence on this rotation	17 (6%)	There were more learners than opportunities to practice skills.	10 (4%)
I saw a wide range of clinical presentation and patients allowing me to enhance my skills.	12 (4%)	I had minimal interaction with patients and had few opportunities to practice my skills.	7 (3%)
This rotation motivated and encouraged me to learn more.	9 (3%)	The rotation was competitive and pitted learners against each other.	3 (1%)
I felt as though my staff and the larger team heard my ideas and suggestions.	14 (5%)	The rotation was too short.	0 (0%)
I received my highest evaluation scores during this rotation.	0 (0%)	I performed poorly on this rotation, which was reflected in my evaluation.	0 (0%)

for factors attributed to positive learning experiences, and n= 240 responses for negative learning experiences.

Rotations that were most commonly perceived as positive were intellectually stimulating (n=35; 12% of responses), had an inclusive, respectful, team-oriented environment (n=34; 12%), were perceived as valuable and transferable to future practice (n=38; 13%), enhanced residents' confidence in their skills and abilities (n=31; 11%), and had supervisors who were available and provided educational opportunities (n=30; 10%; Table 3).

On the other hand, rotations that were described as negative emphasized service over education (n=41; 17% of responses), had unmanageable workload (n=24; 10%), were perceived as having minimal learning (n=28; 12%), had supervisors that were difficult to engage (n=29; 12%), and where the resident received minimal feedback (n=23; 10%; Table 3).

## Discussion

The study findings contribute to an increased understanding of how postgraduate medical trainees define positive and negative learning experiences within clinical learning environments. While other studies have examined features associated with "successful" [10,15,16] and "challenging" clinical learning contexts [11,12], the present study used qualitative and quantitative analyses to characterize positive and negative experiences within a single study. Through a detailed content analysis of narrative descriptions, we identified seven themes that were remarkably similar for both positive and negative learning experiences: organization, educational environment, interpersonal team dynamics, qualities of supervision, self-worth, balance of support and autonomy, and level of responsibility.

The findings reported in the present study align with prior research. For example, the present study found that residents learning experiences were more positive when the clinical placement was well organized and had clearly defined expectations and learning goals; conversely, residents described negative learning experiences as disorganized and without clear learning expectations. These findings align with previous research demonstrating the importance of organized settings and clear expectations on trainees' perceptions of their learning environments [11,12,31,32]. According to Algoso and Peters [33], the lack of structure and clear boundaries increases the likelihood of negative experiences, and consequently, creates unequal learning opportunities across learners. Such findings illustrate the importance of establishing clear goals and expectations at the beginning of a clinical rotation, which should be reviewed and agreed upon by both trainee and staff.

The present study also identified important features of educational environments that contribute to positive and negative learning experiences. The extent to which a clinical rotation provided dedicated time for learning, with protected time away from service responsibilities increased the likelihood for a positive learning experience. Prior research has reported that reductions in clinical and administrative duties are viewed as an educational advantage [17]. Furthermore, the extent to which staff prioritize teaching and learning influence whether residents perceive a given learning experience as positive or negative. Previous studies have shown that learning is enhanced when staff have positive attitudes towards teaching [34,35], while staff who appear dismissive and uninterested in student learning are associated with detrimental learning effects [13,32,36,37]. Lastly, feedback played an important role in residents' learning experience. Descriptions of positive learning experiences highlight the importance of receiving both positive and constructive feedback, which is consistent with prior research [38,39]. In contrast, negative learning experiences were associated with either the complete lack of feedback, or feedback that particularly negative and lacked constructive suggestions for improvement. The lack of feedback during clinical practice has been shown to increase levels of uncertainty in trainees and has been argued to have a negative influence on clinical learning [13].

Differences in the quality of supervision also influenced residents learning experiences in clinical placements. Supervisors who were perceived as supportive and provided positive role model behavior were associated with positive learning experiences, while unsupportive supervisors who exhibited unprofessional behavior were associated with negative learning experiences. Supportive relationships between supervisors and trainees can enhance learning outcomes by creating a 'safe space' for trainees, allowing them to feel secure in asking 'foolish questions' and empowering them to seek out new opportunities to develop their knowledge and skills [40]. On the other hand, difficult relationships with clinical supervisors has been shown to impede learning [11,41]. For example, when faced with an unsupportive supervisor, trainees are less likely to ask questions or take on additional learning experiences [11]. Moreover, O'Mara et al. [11] suggest that positive student-supervisor relationships act as a buffer to unsupportive practice cultures and relationships.

Relatedly, it is also important to consider how interactions within clinical rotations can impact residents' sense of self. Research has shown that there is a high prevalence of depressive symptomatology in resident learners [42]. In our study, self-worth emerged as a factor influencing residents' learning experiences. Negative interactions led some residents to question their career paths and lead to confused role identity. It is problematic if these experiences continue and impact resident well-being, especially in an era where physician wellness is being viewed as increasingly important [43-45]. From here, we need to ask how to identify and support residents who have these negative experiences and conversely how to enhance interactions which promote positive self-worth.

The extent to which team dynamics were viewed as collegial influenced whether residents perceived their learning experiences as positive or negative. Feeling a sense of 'belongingness' and being part of a team has been shown to be an important factor in promoting clinical learning and enhancing professional development [31,33,40]. In contrast, team environments characterized by a lack of collegiality and connectedness are associated with feelings of isolation and exclusion [40]. Taken together, these findings suggest that trainees' experiences will be enhanced by facilitating intra- and inter-professional team interactions.

Positive learning experiences were also associated with having some level of independence, as long as this autonomy was balanced with adequate support. The provision of supported independence provides a safe place for learners to make their own decisions and learn through the process of explaining these decisions to their supervisors [13]. On the other hand, negative learning experiences occurred when resident felt as though they had too little support, or were being micromanaged. Indeed, learner report feeling uncomfortable with constant supervision [46-48]. While research into autonomy in medical education is limited, researchers suggest that autonomy-supportive teaching behavior is something that can be learned [49]. Given the results of the present study, more research is needed to examine the complex interplay between differing levels of autonomy, supervision, and learning.

Lastly, graded levels of responsibility for patient care was also seen as a positive learning experience, while being asked to provide patient care that was perceived as being residents' level of comfort and training was seen as a negative learning experience. Providing learners with increasing responsibilities in clinical activities has been shown to improve learning experiences and promote professional socialization [13,39]. Moreover, the notion of graded responsibility aligns with recent literature on Entrustable Professional Activities (EPAs). An EPA is defined as "a unit of professional practice that can be fully entrusted to a trainee, as soon as he or she had demonstrated the necessary competency to execute this activity unsupervised" ([50], p. 983). In a clinical educational environment, entrustment decisions for EPAs are meant to offer trainees increasing responsibilities with gradual



reductions in supervision [51]. Within the context of our study, positive learning experiences occur when entrustment decisions EPAs are appropriately applied; that is, residents are provided with opportunity to perform increasingly complex functions that correspond with their self-perceived confidence and competence. However, negative learning experiences occur when residents are asked to perform an activity that does not align with their level of training (e.g., an inappropriate entrustment decision is made). Further research is needed to further understand how positive and negative learning experiences are influenced by the application of EPAs at different phases in the medical education continuum.

While the findings in the present study could be regarded as possible conditions for learning, it is important to emphasize that the present study focused on positive and negative clinical learning experiences, as opposed to learning environments. While the two concepts are undoubtedly related, they are not synonymous. A trainee can have a negative learning experience within a positive clinical rotation, just as one can have a positive learning experience within a negative rotation. As a result, educators and program directors need to be aware that the quality of residents learning experiences can vary greatly, even in rotations that receive high overall ratings.

### Limitations

There are several limitations to this study. First, the low response rate restricts the generalizability of our findings. While attempts were made to improve the response rate, specifically by sending several reminder emails to those who had not yet completed the survey and by offering a small incentive for participation (e.g., a chance to be entered into a draw to win one of ten \$10 gift cards) [52], we acknowledge that our response rate was still quite low.

In addition, we acknowledge that a positive or negative experience on the rotation does not necessarily translate to positive or negative learning. As mentioned above, it is very possible that there was rich learning in a rotation which was perceived as negative. There is also a potential for recall bias [53]. By asking participants to recall a certain positive or negative rotation they may be recalling the most recent and not the extreme of that category, i.e. the most negative experience.

Lastly, the study design did not allow for us to isolate the rotations on which the positive and negative experience occurred. As some of the programs responding had the potential to be small, we were concerned about maximizing anonymity and residents' descriptions of positive and negative learning experiences were separated from their demographic information at the time of data collection. As a result, we were not able to identify and analyze potential differences in responses as a function of resident demographics. However, this may serve as a fruitful area for future research. For example, different specialties or years of postgraduate training may operationalize positive and negative learning experiences differently. More research is needed to explore this possibility.

### Conclusions

Overall, this research enhances existing studies by collecting narratives to assess what factors impact positive or negative learning experiences among residents. As it was an exploratory project, we acknowledge the limitations. Despite these, the present study have implications for educators with a vested interest in the clinical learning experience of medical trainees.

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