

A Cost Efficiency Comparison Between The Multiple Mini-Interview and Traditional Admissions Interviews

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Abstract. A major expense for most professional training programs, both financially and in terms of human resources, is the interview process used to make admissions decisions. Still, most programs view this as a necessary cost given that the personal interview provides an opportunity to recruit potential candidates, showing them what the program has to offer, and to try and gather more information about the candidates to ensure that those selected live up to the espoused values of the institution. We now have five years worth of experience with a Multiple Mini-Interview (MMI) process that, unlike traditional panel interviews, uses the OSCE model to have candidates interact with a larger number of interviewers. We have found that the MMI is more reliable and has better predictive power than our traditional panel interviews. Still, the extent to which any measurement is valuable depends also on the feasibility of use. In this paper we report on an exploration of the cost effectiveness of the MMI as compared to standard panel-based interviews by considering the generation of interview material, human resource (i.e., interviewer and support staff) use, infrastructure requirements, and other miscellaneous expenses. Our conclusion is that the MMI requires greater preparatory efforts and a larger number of rooms to carry out the interviews relative to panel-based interviews, but that these cost disadvantages are offset by the MMI requiring fewer person-hours of effort. The absolute costs will vary dependent on institution, but the framework presented in this paper will hopefully provide greater guidance regarding logistical requirements and anticipated budget.

Key words: admissions, interviewing, multiple mini-interview

Introduction

Becoming a physician begins a social/economic contract with a life span often exceeding 40 years. In return for social status and financial security, society expects the physician to provide excellent service, defined in a multi-faceted way

(CanMEDS 2000). It is a contract of enormous economic and personal consequence with the inaugural, and most limiting, determinant of entry being gaining admission to medical school (McGaghie and Kreiter, 2005). As a result, it is important for medical schools to develop and use the best techniques when assessing the academic and personal credentials of each applicant.

High academic ability is essential. The practise of medicine requires, as its intellectual foundation, a profound understanding of human biology and other basic sciences, as well as the cognitive capacity to apply this understanding to the care and treatment of diverse patient groups. Academic achievement is measured throughout one's life prior to application to medical school. The number and availability of resulting data points make it relatively easy to measure academic achievement; the predictive capacity of grade point average (GPA)(Kulatunga-Moruzi and Norman, 2002) and aptitude tests like the Medical College Admissions Test (MCAT)(Julian, 2005) makes it wise to do so.

Yet cognitive ability, in and of itself, provides simply a necessary but insufficient selection requirement. Because the physician interacts with people at the most intimate personal and psychological levels, non-cognitive tendencies such as the capacity to act in a professional manner and communicate one's thoughts clearly must be of a calibre at least equal to that of a physician's cognitive skills. However, skills and achievements in non-cognitive domains are hardly ever formally assessed prior to applying to medical school and rarely become a matter of permanent record; the occasional evaluations that are done are typically informal and often take place in an uncontrolled environment. It falls to admission programs of academic institutions, therefore, to devise a strategy for measuring this domain *de novo* when considering applicants to medical school. The academic organization not only bears the first burden in assessing the quality of future physicians, but it must also bear the initial costs of a poor choice.

Selecting candidates in a manner that utilizes trustworthy assessments of non-cognitive tendencies, however important, provides an ongoing challenge, as there has historically been a paucity of reliable and valid tools for doing so. One way in which this challenge has been addressed is to offer positions to applicants without recourse to personal quality measures. Until recently this had been (and to a certain extent continues to be) the sole practise in the Netherlands where applicants are screened by a grade-weighted scoring system and then admitted to medical school based on a lottery. In North America, despite evidence of poor reliability of traditional interviews (Kreiter et al., 2004), medical schools tend to be uncomfortable accepting reliable cognitive measures as determinants of admission without balancing the scales with some effort to collect non-cognitive measurements. As a result, personal interviews are nearly ubiquitous components of admissions protocols

implemented by medical training programs as they try to gain a thorough profile of the intellectual, ethical and emotional makeup of the applicant (Puryear and Lewis, 1981).

The situation at McMaster University is consistent with this view. Its curriculum is delivered primarily via small-group, tutorial-based interaction that requires constant contact between, and responsibility to, peers, professors and patients. It is natural, therefore, that McMaster's admissions processes continue to place a heavy emphasis on the non-cognitive behaviours that are thought necessary to thrive within the curriculum. To this end the school has traditionally based admission on interviews between candidates and a panel of interviewers, performance in simulated tutorials, autobiographical sketches and academic performance. In the last three years, however, the admissions process at McMaster has undergone extensive revision with the intent to improve its psychometric qualities while still maintaining the philosophical values espoused above. These activities led to the development, testing and installation of the Multiple Mini Interview (MMI) as the chief tool for assessing non-cognitive tendencies of applicants.

Various studies of the MMI have been reported in the medical education literature (Eva et al., 2004a, b, c; Moreau et al., 2006; Reiter et al., 2006), demonstrating the positive psychometric qualities of the assessment tool. These provided the impetus to abandon the traditional interview as well as the simulated tutorial. The resources available for assessment of candidates, however, are finite and along with the scientific quality of such tools, it is necessary to determine their cost to ensure that the tools can be feasibly implemented. We now present considerations of the cost efficiency of the MMI. While the cost of the simulated tutorial used at McMaster was significant, the present paper will compare the costs of the MMI only to those of the classical panel-based interview techniques as these are more commonly used by medical programs. More information on institution-specific costs of the MMI will become available in the coming years, with emergence of similar experiences of other medical schools that have more recently adapted to the MMI. At the time of this writing, we know of a dozen other schools that have gone ahead with implementation of the MMI.

A secondary goal in presenting this paper is to provide answers to frequently asked questions regarding the logistics involved in mounting a multiple mini-interview. We have described the strategies used to implement the MMI at McMaster to address most of these questions simply because McMaster has the most experience with the MMI; many other schools have now successfully implemented this interview process, each implementation presumably being accompanied by institution-specific idiosyncrasies.

Methods

To perform this study we have broken the process of creating and running an MMI into its component parts (station development, the number of assessors required and amount of time required of them, staff resources, miscellaneous expenses, and infrastructure costs), each of which will be considered in turn.

The MMI is an adaptation of the Objective Structured Clinical Evaluation (OSCE)(Harden and Gleeson, 1979) and shares some of its characteristics. Much like the OSCE, the major cost is the time required of personnel (both assessors and staff) (Cusimano et al., 1994; Reznick et al., 1993). Because a substantial number of assessors are clinicians, their time is very expensive, but highly variable. Complicating matters further, it is a matter of principle at McMaster, that all the stakeholder groups (faculty, students, and community-members) are equally represented within the admissions process. As a result of this heterogeneity it is difficult to place a dollar value on the amount of time required (i.e., a direct cost comparison cannot easily be made). Indeed, it is anticipated that the monetary value associated with assessors will be highly context-specific across institutions. More generalizable, we suspect, is the time requirements associated with the two forms of interview. As such, we will use time as the primary measure of the economy of the techniques.

This metric may actually be more ecologically valid than dollar value, at least for faculty at McMaster, because all observers are volunteers. This donation of time is, however, supported by departmental chairs that accept participation in admissions processes as part of the obligatory educational activity of faculty. The end result is that the school does not incur any direct costs for the scores of individuals who donate weekend days to take part in the selection of medical students. As a result it would fall on the lower end of the cost range defined by others in assessing cost efficiency of the OSCE (Cusimano et al., 1994; Reznick et al., 1993). Table I summarizes the main costs incurred by each interview protocol in addition to making note of the metric on which the costs will be compared and the method of payment.

THE MULTIPLE MINI-INTERVIEW

Stations and scenarios

The major similarity between the MMI and the OSCE is that both consist of a series of stations, each one presenting a specific focus. Unlike the OSCE, however, the scenarios included in each station are not clinical and are designed to assess personal characteristics rather than a learned skill. An MMI station, as presently constituted, requires 8 minutes of contact time (observation of the applicant's performance) and two minutes for completion of an assessment form (including a short series of 10-point, norm-referenced scales).

Table 1. Cost requirements for mounting Multiple Mini-Interview and Traditional Interviews

Requirement	Basis of cost comparison	Method of payment	Required for ...	
			MMI	Traditional Interviews
Creation of Stations	Time	Credit toward academic obligations / Financial	yes	no
Assessors	Time	Credit toward academic obligations	yes	yes
Staff (planning, implementation, and data entry)	Time/Salary	Regular salary, overtime, and/or time off	yes	yes
Miscellaneous expenses (breakfast/lunch/ coffee/parking)	Quantity	Financial	yes	yes
Infrastructure	Availability	Provided in kind / Financial	yes	yes

There are three general types of stations: discussion, interpersonal skills and co-operation. In a discussion station, the scenario contains issues that anybody aspiring to medical school should be able to consider and discuss. For example, candidates might be asked to discuss the ethical nature of providing patients with false reassurance through the administration of placebos as therapy. The station requires the applicant to present the issues and defend his/her position through discussion with an assessor. With multiple stations, a wide scope of issues can be addressed, including political, ethical, and educational matters. An interpersonal skills scenario exposes the applicant to an emotional situation that he/she is required to address in a performance-based manner and, if possible, resolve. Finally a co-operation station is one in which two applicants are required to jointly complete a task that requires a high degree of co-operation. In all cases, an independent assessor observes and rates each candidate's performance.

Organizational structure of the MMI

Like in an OSCE, the working unit for an MMI is a circuit that consists of multiple stations. In the research phase the McMaster MMI had 9 or 10 stations but once it was accepted as the assessment tool the number of stations expanded to 12. In this paper, we base our calculations of the costs

on circuits of 12 stations. In a typical administration, each circuit would run twice (once in the morning and once in the afternoon) on any given day. Candidates enrolled in the morning run are kept separate from those enrolled in the afternoon run and the stations are changed across day to avoid breaches of test security despite research evidence that anticipatable breaches will have minimal impact on performance scores (Reiter et al., 2006). To the extent possible, the scenarios for different days are matched with respect to level of difficulty.

Implementation of the MMI

At the beginning of the process one applicant is assigned to each station so each circuit has 12 applicants. A buzzer sounds to inform candidates that the MMI has begun (i.e., that they may read the scenario posted to the door of their station). After two minutes a second buzzer sounds to inform candidates they may enter the room to begin the station. Eight minutes after they enter the room a third buzzer sounds to indicate completion of the station. Candidates exit the room and proceed to the next station. They have two minutes to read the scenario and examiners have two minutes to complete the scoresheet. Another buzzer then signals the start of the second station. This cycle continues until each candidate has passed through all 12 stations. It is possible to increase the number of applicants by including rest stations (i.e., sequestered areas where applicants stay for 10-minute periods built into the MMI). Evaluation of 400 applicants requires 31 MMI circuits of 12 stations and 1 rest station. With 8 parallel circuits, an MMI this size has been completed in two days with two runs per day.

THE TRADITIONAL INTERVIEW

In the classical interview used by the McMaster medical school, one event was an interview of a single applicant. The process required three interviewers per applicant and one hour of interview time. The interview itself lasted 40 minutes followed by 20 minutes during which time interviewers would collect their thoughts and provide independent assessments of the candidate. Evaluation of 400 applicants required 400 such events. These events were typically spread over 4 weekend days. Within any given weekend day 16 teams of 3 interviewers would each be expected to assess 6 candidates.

For the sake of further comparison, four hypothetical variants of the traditional interview are discussed in the analysis. One event is defined as a single interview with a single applicant. Each variant involves a change in the number of interviewers on the panel and/or the time allotted for the interview/scoring process. In variants A and B the time remains constant relative to McMaster's traditional interview (i.e., one hour per interview), but

the number of interviewers is reduced by one and two, respectively. Variants C and D are the same as variants A and B except that the time is reduced to 30 minutes per interview. Variant A appears to be most representative of the way in which interviews are typically used in US medical schools as Johnson and Edwards have reported that on average candidates are interviewed for 44 minutes (plus marking time) by 2 interviewers (Johnson and Edwards, 1991).

Results

CREATION OF STATIONS

The one resource requirement that separates the MMI from less structured personal interviews is that stations must be authored in advance; this difference may be smaller at institutions that have followed the advice to use structured interviews by providing interviewers with specific questions to ask each interviewee (Wiesner and Cronshaw, 1988). Whereas candidates themselves see only a paragraph of text outlining the focus of each MMI station (see references Eva et al., 2004a, b for examples), assessors are provided with considerably more information. Each station consists of four parts (a) Instructions to the applicant – the paragraph of text plus a sentence of instruction that is posted to the door of each station, (b) Instructions for the assessor – a page of material outlining the purpose of the station (including potential questions that could be asked), the time available to the applicant, and guidelines that should be considered when evaluating the applicant's performance, (c) Background and theory – a page of information for the assessor to ensure he/she is informed regarding the issues inherent in the station (e.g., on an ethical station requiring a choice the observer would receive both pros and cons relating to a number of different choices to ensure he/she was positioned to challenge the applicant), and (d) A scoresheet – a series of 10-point norm-referenced rating scales accompanied by a comments box. We do not ask examiners to listen/watch for candidates to say or do anything in particular. Rather, we have adopted the lesson learned from the educational community's experience with OSCEs that suggests subjective global judgments are as reliable, but more valid than more objective checklist scoring (Hodges et al., 1999).

Creation of these materials provides a significant investment of time and expertise prior to the interviews ever taking place. It is important, however, that this time be invested as it is the station generation and selection phase of the MMI that will determine the focus of the interviews. We recommend that each institution implementing the MMI carry out a blueprinting process to ensure that stations are selected in a way that is consistent with the philosophical tenets of the institution (Reiter and Eva, 2005). As noted above, we

have chosen to use different stations each day of interviews to minimize concern about security breaches. As a result, a 12-station MMI run over two weekend days requires creation of 24 distinct stations. We have created a database of stations over the three years of development and pilot testing that took place before the MMI was implemented as the actual admissions protocol in 2004. This database was further supplemented through the recruitment of faculty, staff, and community members to station-writing workshops that took place two months prior to the 2005 MMI. Station writers were paid \$50 per station, the result being well over 100 stations within the database.

Based on these experiences we can say that creation and selection of each station from scratch requires roughly three hours of time. Creation of 24 stations for a two-day MMI, therefore, requires approximately 72 person hours (i.e., the equivalent of three full circuits). Relative to the 800 observer hours required to mount an MMI for 400 candidates (see below) this cost represents a 9% increase over the interview process itself. Nevertheless, it does represent a substantial cost for establishing an MMI. We recommend building and maintaining a bank of stations through a process in which faculty are rewarded for investing in the educational activities of the school, as is done in many institutions when building/maintaining OSCEs. It is important to note, however, that this burden should be a decreasing one given that, with each cycle, the bank of stations increases. Eventually the bank will be sufficiently large that only routine maintenance, comprising the addition of a few stations per year, will be required. McMaster's database is available to get interested parties started.

ASSESSORS

Once the stations are set, the time costs inherent in mounting an MMI are summarized in Table II and compared to the time costs inherent in mounting traditional McMaster interviews. In addition, time costs of four variants on the traditional interview are provided. Data in all cases are normalized to one event (i.e., one complete applicant interview). In the MMI, the event is defined as a single circuit with 12 stations, each consisting of 8 minutes of contact time with the applicant and 2 minutes of assessment time.

For each of the MMI, McMaster's traditional interview, and four variants, Table II presents (a) the number of observers (i.e., interviewers) required, (b) the number of applicants involved per event, (c) the number of observer hours per applicant (i.e., the length of the event multiplied by the number of observers interacting with each candidate at any one time), (d) the number of applicants interviewed per hour, (e) the number of hours required to interview 400 applicants (i.e., 400 divided by the number of applicants per hour), and (f) the observer hours required for 400 applicants (i.e., 400 times the number of observer hours per applicant).

Table II. Time requirements for mounting Multiple Mini-Interview and Traditional Interviews

Technique	Event	No. of observers required	No. of applicants per event	No. of observer hours per applicant	No. of applicants per hour	Hours of interviewing required for 400 applicants	Observer hours for 400 applicants
12-station MMI	1 circuit	12	12	2.0	6	66.7	800
Traditional McMaster Interview	Interview with one applicant	3	1	3.0	1	400	1200
Variant A (2 interviewers, 1 hour)	Interview with one applicant	2	1	2.0	1	400	800
Variant B (1 interviewer, 1 hour)	Interview with one applicant	1	1	1.0	1	400	400
Variant C (2 interviewers, 30 minutes)	Interview with one applicant	2	1	1.0	2	200	400
Variant D (1 interviewer, 30 minutes)	Interview with one applicant	1	1	0.5	2	200	200

Table II shows that the MMI is considerably more efficient in the number of hours it takes to evaluate 400 candidates. Relative to the traditional interview process utilized at McMaster, the MMI requires 67% (800:1200) as many observer hours per applicant and 16% (66.7:400) as much time. The immediate result is that the same numbers of interviews were completed in one weekend in 2004 (using the MMI) as were done using the traditional process requiring two weekends in 2003. While the MMI is consistently more efficient in terms of number of interview hours required regardless of which other variant is used, the number of observer hours required reveals a different picture. The number of observer hours required of the MMI is equivalent to that of Variant A (i.e., the most typical model used in US medical schools (Johnson and Edwards, 1991) in which 2 interviewers assess candidates for 1 hour. Institutions that use models in which only 1 interviewer is used or interview for only 30 minutes (including marking time) may see an increase in the observer hours required upon implementing a 12-station MMI.

STAFF

The McMaster Medical School is fortunate to have an excellent secretariat that has participated in the traditional interviews and, more importantly, in the organization and administration of OSCEs. These experiences and the existing operating procedures facilitated studies and installation of the MMI. An admissions coordinator organizes the event, the actual running of the process, and assessment of the results. Organization of the event requires a similar effort in both the classical and the new admissions techniques. Assessors must be recruited, trained and assigned both location and times. In both admission techniques applicants must be registered, directed to the appropriate rooms for the interviews and to other events that are associated with the admissions process. The main difference is that 48 assessors were traditionally recruited each of four days to complete the old admissions process and 96 assessors are now recruited for each of two days during which the MMI is run. In addition, 8 volunteer actors (one per circuit) are typically recruited from the cohort of current medical students to portray the roles required of the interpersonal stations.

The number of support staff required to be in attendance during an MMI is greater on a daily basis than for the traditional 3 person interview, but roughly equivalent overall. In the latter case, two staff personnel were required for registration, one staffed the reception area, one staffed the personal interviews area and a floater worked each of the 4 days. In total then, 5 staff members were required per day to run the process. The MMI, in contrast, requires one staff person per each of eight circuits (though we often use two staff members per circuit to ensure redundancy) for each day in addition to two registrars and one floater for a total of 11 (or 19 with two

staff per circuit) on each day. The traditional interview required 4 days (lasting 9 hours) to assess 400 hundred applicants (i.e., 180 staff hours). In contrast, the MMI required only 2 days (lasting 7 hours) for the same number of applicants. Thus, running the MMI with one staff member per circuit requires a total of 154 staff hours. That is, there is a 14% savings in support staff requirements for the MMI relative to the classical McMaster Interview, but the time required must be spread over twice as many people. Two hundred and seventy eight staff hours are required if two observers are used per circuit. Unlike the assessors, McMaster pays staff of the secretariat for their participation during the admissions weekends, either in overtime salary or in compensating time off. The preference of the administration of the School is for staff to take compensating time off by selecting mutually convenient times, and thus minimizing the costs.

MISCELLANEOUS EXPENSES

Because examiners and staff are expected to participate in either interview process for a full day (including registration and meals, a "day" lasts approximately 7 hours when using the MMI and 9 hours when using the traditional interviews) breakfast, lunch and refreshments for the observers are also a necessity. The schedule for the MMI tends to be as follows: 8:30 registration and breakfast, 9:00 delivery of the examiner packages (all assessors examining a particular station gather together to review and discuss the materials), 9:45 dispersion of examiners to circuits, 10:00 MMI morning run, 12:00 lunch, 1:00 MMI afternoon run, 3:00 examiners finalize and submit ratings, 3:30 departure. In addition, as a service to staff and assessors, the MD program typically provides parking vouchers for those who drive to campus to participate in the admissions process. 192 examiners are required of both the MMI and the traditional interviews, thereby making the cost of these peripheral expenses identical in both systems.

INFRASTRUCTURE

Finally, it should be noted that there are infrastructure costs that must be considered upon implementing any admissions protocol. We define infrastructure in terms of physical space and printed materials required to carry out the interviews and have data entered. The weekend timing is common to both the classical interview and the MMI because both techniques require the availability of many rooms, primarily drawn from clinics in the McMaster University Medical Centre; this physical space is only available on the weekends. It was particularly important for the MMI because these clinics have a reasonable number of examination rooms that are located close to each other. Such an arrangement is ideally suited for the OSCE-type station format as it allows applicants to move from one station to the next within

seconds. This provides sufficient time to read the scenario before starting the station itself. It also facilitates control of the circuit by one manager. The MMI, as we have mounted it, utilizes 8 clinics, each with a circuit of 12 rooms. In the traditional interview 16 rooms were required per day, one for each of 16 teams of assessors. This space in both instances is provided in kind by the hospital administration.

Finally, documentation is a requirement for all evaluation processes. Forms must be filled out and their information evaluated. This affects time required for the actual event and subsequent assessment of results obtained during the interview. Each candidate sitting the MMI is evaluated by 12 assessors, resulting in 12 scoresheets, four times as many as those required of a 3-person interview panel. This difference equates to a \$0.45 increase per candidate – a relatively small difference, at least monetarily. Ideally an electronic scoring system mounted with Personal Digital Assistants (PDAs) would be used to minimize paper use and data entry errors, but as they are not owned by all assessors and not all assessors are, as of yet, comfortable with their operation we have yet to take this step.

Non-specific to any interview process, it should be noted that there are issues inherent in the type of scoresheet used. Numeric scales have the advantages of being easily interpretable and quick to complete whereas open-ended questions enable a rich narrative to be recorded. Narrative evaluations create an additional time burden on the assessors and collators of information. As such, we have chosen to follow the advice of Dawes who has shown conclusively that actuarial models of decision-making in which a weighting scheme is derived and utilized outperform committee-based decisions in which each file is presented in narrative form and consensus sought (Dawes et al., 1989). The advantage of specificity gained by the committee-based methods is more than overcome by the disadvantage of our human tendency to find exceptions. As such, we use the comments box provided on our scoresheets simply to screen for any egregious behaviour that should rule out individuals from consideration.

Discussion

The MMI makes excellent use of observer time by allowing more students to be seen by more observers. This opportunity to sample behaviours multiple times is one of the integral reasons that led to its development and this continues to be the fundamental reason we believe the MMI has shown itself to be advantageous with respect to improving the predictive validity of the admissions process (Eva et al., 2004c; Reiter et al. (submitted)). The data presented in this paper also suggest that the MMI is at least as cost efficient as many other personal interviews formats. The cost comparisons of the MMI to the most typical model used in US medical schools (Johnson and Edwards,

1991) are summarized in Table III. The MMI requires greater preparatory efforts relative to an unstructured traditional interview in that a blueprint must be created and stations must be written/selected/revised in a way that matches the blueprint. In addition, institutions interested in using interpersonal performance-based stations may require simulators and they are not usually part of a normal interview process. We have been successful at minimizing this expense thanks to the engagement and good will of our medical students. The other disadvantage faced by the MMI relative to a traditional interview protocol is the requirement of a greater number of rooms. We at McMaster are fortunate to have access to a large enough number of clinics to allow 8 circuits to be run in parallel. Other institutions who are not as fortunate may need to consider (a) running fewer parallel circuits by spreading the interviews out over a greater number of runs/days, (b) interviewing fewer candidates, or (c) running interview circuits across multiple sites – a manageable feat given that each circuit is an independent entity.

These disadvantages, however, are more than offset, in our opinion, by the improvement of the interviews' psychometric properties. The MMI is considerably more cost efficient in this regard than the classical interview technique used at McMaster. In terms of interview hours the MMI is more efficient than all variants of the personal interview considered in Table II. In terms of observer hours the MMI is equivalent to the variant most commonly used by US medical schools (variant A), but less efficient with respect to shorter interviews or those performed with only one interviewer.

The fewer the interviewers, however, the less tenable the interview process will be given most accepted psychometric standards of rigorous evaluation (Wiesner and Cronshaw, 1988). Within medicine previous studies using one or two observers per station indicate that the reliability of an admissions interview improves as a function of the number interviews performed (Kreiter et al., 2004; Eva et al., (2004a). The MMI, in contrast, has been shown to be more predictive of performance within medical school than traditional interviews (Eva et al., 2004c; Reiter et al. (submitted)). When properly conducted it appears to be immune to gender or cultural bias (Eva et al., 2004a; Moreau et al., (2006), and worry about test security appears not to be a grave concern (Reiter et al., 2006).

By virtue of the short time since its inception, experience with the technique to date is still limited and has not exhausted the search for optimal administration. For instance, results from studies on a surgical OSCE suggest that, for clinical evaluations, five-minute stations perform as well psychometrically as ten-minute stations (Lind et al., 1999). If the analogy holds, then there is further scope for reducing the time requirements for the most costly item in both MMI and traditional interviews – the personnel hours. Such psychometric studies, creation of station banks, and increased use of

Table III. Cost assessments for mounting Multiple Mini-Interview and Traditional Interviews

Requirement	Cost of MMI	Cost of Typical US Traditional Interview
Creation of Stations	72 hours of creation time for 24 MMI stations \$50 per station = \$1,200	Dependent on amount of structure built into interview (N/A at McMaster)
Assessors	$N = 192$ (96 per each of 2 days of interviews) 66.7 hours per 400 candidates 800 observer hours per 400 candidates	$N = 192$ (48 per each of 4 days of interviews) 400 hours per 400 candidates 800 observer hours per 400 candidates
Staff (planning, implementation, and data entry)	Admissions coordinator 154 to 278 staff hours (11 to 19 staff spread over 2 days of interviews) 8 actors for each of 2 days $\approx \$4,000$	Admissions coordinator 180 staff hours (5 staff spread over 4 days of interviews)
Miscellaneous expenses (breakfast/lunch/coffee/parking)	$\approx \$4,000$	$\approx \$4,000$
Infrastructure	8 clinics with 12 rooms provided in kind 4,800 scoresheets (\$240)	16 clinic rooms provided in kind 1,200 scoresheets (\$60)

technology such as PDA use may further enhance the administrative advantages of the MMI outlined in this paper.

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