Factors predicting identity as educators and openness to improve: an exploratory study

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CONTEXT Researchers suggest that teachers' work environment affects their sense of connectedness and appreciation, which affects their educator identity. However, sessional (also known as adjunct, clinical, contingent and non-tenured) faculty members may struggle with their educator identity. The purpose of this exploratory study was to examine the extent to which perceived connectedness and received appreciation predicted identity as a medical (health care science) educator and openness to improve in tenure-track and sessional faculty members.

METHODS We utilised an 'identification with teaching' scale to measure medical educator identity. We developed scales to measure perceived connectedness to university department, openness to improve teaching, and appreciation as a motivation to try a new teaching method. We then hypothesised a path model between these constructs. We surveyed faculty members at a health sciences school and performed confirmatory factor analyses and structural equation modelling using data from a sample of 73 tenure-track and 146 sessional faculty members to explore support for the hypothesised model.

RESULTS Connectedness and appreciation predicted identity as a medical educator and openness to improve in different ways for sessional and tenure-track faculty members. For tenure-track faculty members, appreciation predicted medical educator identity and openness to improve, whereas a sense of connectedness trended towards predicting an openness to improve. For sessional faculty members, connectedness to their department predicted their identity as a medical educator, which acted as a mediator to predict an openness to improve.

DISCUSSION Our data supported the hypothesised model, but the sessional and tenure-track faculty models differed in strength and focus. We explore reasons for these differences based on the working environment of each teacher type. We suggest that the two models partially explain the transformation from 'a clinician who teaches' to a medical educator. Finally, we make suggestions for how identity as a medical educator and openness to improve may be encouraged in both types of teachers.

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INTRODUCTION

Teacher identity is increasingly seen as central to the teaching profession.[1] Authors of a systematic review identified several variables as being important to the development of teacher identity in the university context, including: a sense of appreciation, a sense of connectedness, a sense of competence, a sense of commitment, and imagining a future career trajectory.[2] Research has also shown that the transition from health care clinician identity to health care educator identity can be difficult as the expert clinician needs to become a novice teacher.[3] Researchers have described the progression of becoming a medical educator (i.e. an educator involved with teaching the healthcare sciences) in new tenure-track faculty members (TF) as being in phases that can take up to 1–3 years as clinicians identify the complexities of teaching and realise their clinical skills do not necessarily make them good teachers.[4–6] In response to this challenge, programmes to enhance teaching quality and skills have been found to increase identity as a medical educator in TF.[7–9] (For the purposes of our study, TF were defined as all faculty members hired for a permanent position.)

Educator identity has also been explored for sessional faculty members (SF), both in community-based physicians[10,11] and in occasional faculty developers.[12] Referred to by many names across cultures and disciplines (e.g. adjunct, part-time, contingent, occasional, casual, non-tenured, community-based preceptors), SF are usually appointed as non-tenure track and often have a contractual, part-time relationship with their institution.[13] (For the purposes of this study, SF were defined as health care professionals who taught health science students directly in the classroom or clinic and were considered non-tenured.) Because identity is seen as important to quality teaching, one goal of faculty development (FD) may be to consider factors that strengthen teacher identity in both TF and SF.

Educator identity also has been linked to reflective practice.[14] Reflection is suggested as a strategy for all teachers to better understand and improve their teaching practices,[15–17] as reflection integrates new learning into existing knowledge and skills.[18] Identity as a medical educator has been linked to improvements in teaching skills as well[19] and TF, seeing their new identity as a medical educator in an FD programme, reported being more comfortable with trying new techniques.[7] In addition, students in the health sciences prefer faculty members to use a variety of teaching methods to promote an optimal learning environment,[20] as seen in a medical student teaching survey.[21] Compared to using diverse teaching methods, using lectures primarily is associated with superficial learning, less critical thinking and less cognitive engagement.[22] Therefore, when educator identity is strong, both reflection and diverse teaching methods are practised, which improves teaching, student engagement and student outcomes.[23,24] A question for faculty developers and administrators wanting to help teachers improve their teaching then becomes: What factors can they enhance that may strengthen faculty members' identity as teachers and help teachers to become more open to reflection and diverse teaching methods?

As mentioned previously, authors of a systematic review determined that both a sense of appreciation and a sense of connectedness are important to the development of teacher identity but noted that both can be strengthened or constrained by the work environment of the teacher's department.[2] Various studies have evaluated appreciation and the benefits of communities of practice for TF, including faculty learning communities, as ways to engage faculty members, in the hope of improving teaching, although the literature is limited on outcomes.[9,25–28] A group of teachers who may struggle with feeling connected and appreciated are SF. Buch et al.[13] reported that the overwhelming challenge mentioned by SF was 'the sense of isolation and disconnectedness from their departments and colleagues' (p. 30). They may also view themselves as a 'clinician who teaches'[29] rather than a medical educator and have different needs with respect to FD.[30] Exploring how SF are different from TF may help faculty developers create interventions appropriate for each type of teacher. As TF and SF may experience and value connectedness and appreciation differently based on their work environments, we wanted to conduct an exploratory study to examine whether models that predict identity as a medical educator and an openness to improve were different for these two populations.

Hypothesis

We based our hypothesis on a systematic review linking a sense of connectedness and appreciation to educator identity.[2] Our primary research question was: To what extent do appreciation and

connectedness predict identity as a medical educator and an openness to improve one's teaching for TF and SF? Based on the literature, we made the following hypothesis: Appreciation for efforts to improve teaching and increased connectedness with a department will each predict higher identity as a medical educator, which will serve as a mediator in predicting a more open attitude to improve teaching by reflective practice and use of diverse teaching methods (see Fig. 1).

It is unknown whether this same model applies to both SF and TF. Therefore, we conducted an exploratory study to examine differences between these types of faculty members.

METHODS

Participants and procedure

This study took place at the Health Sciences School at the University of Iceland (HSS). The National BioEthics Committee indicated there was no need for their approval given the nature of the collected data. We announced the project to the Icelandic National Data Protection Authority, who publicised the project as per Icelandic regulations.

We obtained TF e-mail addresses and distributions across disciplines and gender through online resources for HSS. No centralised list of health science SF e-mail addresses was available from the university, so we generated one through various resources. For both the pilot and main study, invitations were e-mailed, with a link to the online survey. Two weeks after the initial e-mail invitation, reminder e-mails were sent to teachers who had not participated. Participation in the survey served as consent for participation in the study. A sample of 78 TF and 160 SF completed the survey (37% and 25% response rate, respectively), which is within the range of other published faculty development surveys.[31–34] In our TF sample, 62% were female and 54% were over 52 years old, whereas in our SF sample, 71% were female and 38% were over 52 years old. Additional demographic information, including comparisons to university-reported values regarding gender, age range and discipline within HSS, based on instructor type (i.e. TF or SF), is available as Data S1 or upon request from the primary author.

Survey development

Following the Association for Medical Education in Europe (AMEE) Guide for developing questionnaires, we performed a literature review of teacher identity theories and recent motivation and needs surveys, which were synthesised with input from teacher interviews into a survey.[31] The survey included a previously validated scale, which we utilised to measure *identity as a medical educator*: Identification with teaching is a four-item scale, adapted from engineering, to evaluate identification with a profession.[32] *Identity as a medical educator* is a measure of the extent to which teachers value both their role and performance in teaching as an important part of the self.[33] An example from this scale is: 'Being good at teaching is an important part of who I am'. The survey also included three scales, newly developed by the researchers for the purpose of this study: (i) a three-item scale of instructors' perceived *connectedness* with their department and colleagues (e.g. 'I feel connected to my [university name] department colleagues'); (ii) a four-item scale of motivation to try a new teaching method by forms of *appreciation* (acknowledgement, financial compensation, supervisor feedback or improved student

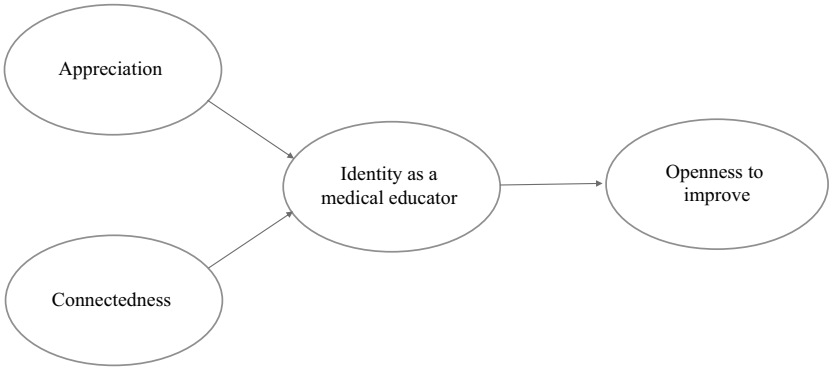

Figure 1 Proposed model

evaluations); and (iii) a three-item scale of *openness to improve* teaching (OP) (e.g. 'It is part of my responsibilities as a teacher to reflect on my teaching skills and how I can improve my teaching', 'It is part of my responsibilities as a teacher to use diverse teaching methods'). (Items used in each scale are provided in Data S1 or upon request from the primary author.) The items were based on similar items used in surveys published in the literature.[34–36] Participants rated statements on a 6-point Likert scale (1 = 'strongly disagree', 2 = 'disagree', 3 = 'somewhat disagree', 4 = 'somewhat agree', 5 = 'agree', and 6 = 'strongly agree'), but participants were also given the option of 'choose not to answer'.

Suggested guidelines[37] were utilised for the adaptation of the survey to Icelandic, which included translation by a bilingual expert into Icelandic, synthesis, back-translation by a second bilingual expert into English, review by an expert committee (two additional bilingual experts), and pilot testing with review. A total of 32 TF and 48 SF from HSS participated in the online pilot testing conducted a month prior to general administration of the survey. Icelandic translation of the validated scale showed similar internal consistency to previously reported measures[32,38,39] and all scales showed good or acceptable internal consistency with Cronbach's alpha (α),[30] as reported in Table 1.

Data analysis

Pilot testing identified no single item measures that were problematic as a result of the translation process; therefore, the pilot data were added to the main data collected for full analysis. Although 78 TF and 160 SF completed the survey, 12 TF and 42 SF did not choose to rate all the statements pertaining to the scales and were considered missing data points. Of these, we discarded the data from five TF and 14 SF because they chose to not rate more than one item from the same scale. With the remaining data from seven TF and 28 SF, we performed imputation using the average of the other item ratings in that scale as a substitution for the missing data. The final sample included 73 TF and 146 SF for the analysis. A flow-sheet figure from pilot testing to the final sample is available as Data S1 or upon request from the primary author (AGS).

We decided to use structural equation modelling (SEM) for analysis because of its flexibility in estimating relationships between constructs and because it accounts for measurement error.[40] It includes a measurement model that allows relationships between variables (items) and constructs (scales) through confirmatory factor analysis (CFA) and a structural path model that relates constructs to other constructs.[40] All statistical analyses were performed using SAS 9.4 (SAS Institute Inc., Cary, NC, USA). We used the PROC CALIS procedure for conducting the CFA, using the maximum likelihood estimation method. We obtained a measurement model with good fit to the data for all teachers and confirmed the good fit measurement model with the subgroups of TF and SF individually. We tested for factor structure and model fit and used the CALIS procedure for SEM with FACTOR model type used and latent factor variances fixed to 1.0. We estimated the hypothesised structural model for SF and TF individually. Fit indices using χ^2 and measures representing the three major index classes (i.e. absolute fit index, parsimonious fit index and comparative fit index [CFI]) determined the acceptability of the data-model fit as represented by standardised root mean square residual (SRMR), root mean square error of approximation (RMSEA) and CFI. According to Hu and Bentler[41] the model–data fit can be considered good if the SRMR value is

Table 1 Reliabilities and correlations amongst the scales

	α	1 All (TF, SF)	2 All (TF, SF)	3 All (TF, SF)
1. Appreciation	0.76	–		
2. Connectedness	0.78	−0.06 (−0.05, 0.04)	–	
3. Identity as a medical educator	0.80	0.25 (0.47, 0.18)	0.18 (0.02, 0.21)	–
4. Openness to improve	0.69	0.33 (0.51, 0.18)	0.18 (0.26, 0.15)	0.60 (0.55, 0.64)

All = both TF and SF combined; SF = sessional faculty; TF = tenure-track faculty; α = Cronbach's alpha.

≤0.08, the RMSEA value is ≤0.06 and the CFI value is equal to or >0.95. Other models using the same constructs in different relationships were estimated as well to determine if our hypothesised model was the best fit for each type of teacher. The significance threshold was set at 0.05.

RESULTS

The standardised factor loadings of the CFA for the individual observed variables associated with each scale (*identity as a medical educator*, *connectedness*, *appreciation* and *openness to improve*) ranged from 0.45 to 0.90 when considering all teachers, and all coefficients were statistically different from zero ($p < 0.0001$). The reliabilities for each measure, along with the correlations with the other factors with all teachers combined (and in the subgroups of TF and SF), are included in Table 1. As reported, internal reliability of the scales was good as indicated by Cronbach's alpha. The lowest correlations were seen between *connectedness* and *appreciation* and the highest correlations between *identity as a medical educator* and *openness to improve*. Correlations for TF were higher than for SF when considering the relationship between *appreciation* and both *identity as a medical educator* and *openness to improve*. A CFA with the *identity as a medical educator*, *connectedness*, *appreciation* and *openness to improve* measurement model for all teachers, in which all factors were allowed to covary, determined that each scale was unique, as shown by the following good fit indices: χ^2 (71) = 80.99, RMSEA = 0.03, SRMR = 0.05 and CFI = 0.99.

When the hypothesised model was applied to TF (n = 73; Fig. 2), the numbers indicated a good fit, except that the CFI (0.94) was less than the standard and there was a non-significant relationship between *connectedness* and *identity as a medical educator* ($\beta = 0.07$, $p > 0.05$). We considered modifying the model because we suspected that the *appreciation* and *connectedness* for the TF variable might be related to how supportive the departmental community was of teaching improvement. We modified the model as shown in Fig. 3 so that *connectedness* and *appreciation* would have a direct effect on *openness to improve* and model fit was superior (lower χ^2 and better fit indices). We refer to this model as the TF model from this point on. Further investigation of the structural patterns in the TF model showed that the hypothesised path leading from *appreciation* to *identity as a medical educator* was significant ($p < 0.0001$). Both the path from *identity as a medical educator* to *openness to improve* and the direct path from *appreciation* to *openness to improve* were significant ($p = 0.03$ and $p = 0.006$, respectively). The calculated indirect effect of 0.155 (*appreciation-identity as a medical educator-openness to improve*) was less than the direct effect of 0.39 (*appreciation-openness to improve*), so *identity as a medical educator* could not be assumed to be a but is assumed to be a full mediator between *appreciation* and *openness to improve* but is assumed to be a partial mediator.[42] The path from *connectedness* to *openness to improve* was close to being significant ($\beta = 0.23$, $p = 0.06$).

For the SF (n = 146), the hypothesised SEM model (Fig. 1) fit was considered the best fit, as shown in Fig. 4 (and will be referred to from this point on as the SF model). We also attempted to apply the new TF model and other models to our SF population, but they resulted in higher χ^2 values and fit indices, thus indicating the TF model was inferior to the SF model for predicting results for SF. Further investigation of the structural patterns in the SF model showed the hypothesised path leading from *appreciation* to *identity as a medical educator* was not

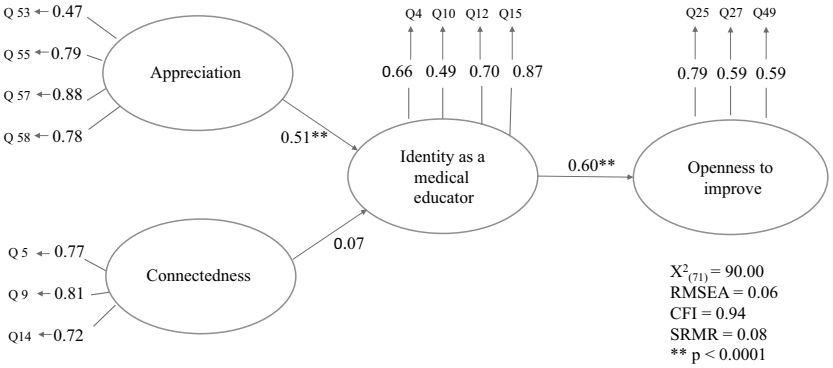

Figure 2 Hypothesised model with tenure-track faculty members (n = 73). Did not provide the best fit. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardised root meant square residual

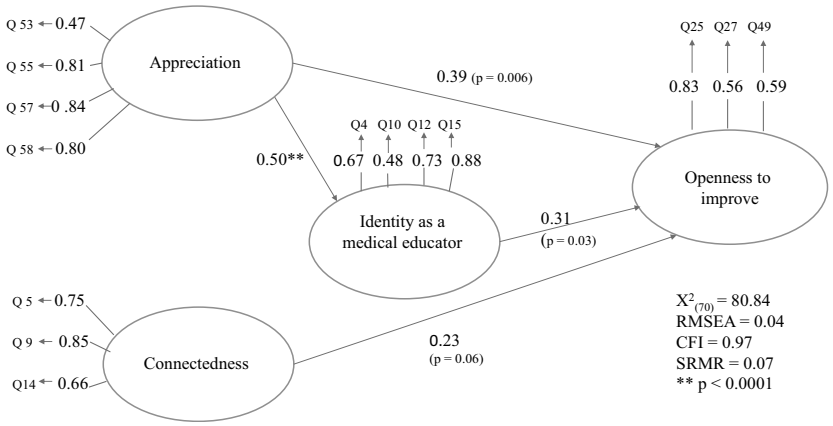

Figure 3 Tenure-track faculty model with tenure-track faculty members (n = 73). Best fit. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardised root meant square residual

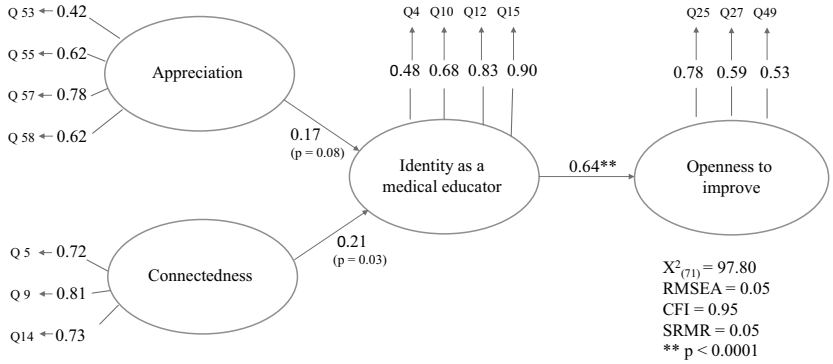

Figure 4 Sessional faculty model with sessional faculty members (n = 146). Best fit. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardised root meant square residual

significant at the 0.05 alpha level but was close to being significant (β = 0.17, p = 0.08). The path from *connectedness* to *identity as a medical educator* was statistically significant (β = 0.21, p = 0.03), as was the path leading from *identity as a medical educator* to *openness to improve* (β = 0.64, p <0.0001). We tested for mediation and found that *identity as a medical educator* was indeed a full mediator between appreciation and openness to improve as the β value for the direct path between *connectedness* and *openness to improve* (0.04) was less than the calculated indirect effect (0.13).

DISCUSSION

Summary of findings

The purpose of this exploratory study was to examine the extent to which perceived connectedness and received appreciation for trying a new teaching method predicted identity as a medical educator and openness to improve in TF and SF. We proposed a theoretical basis for appreciation and connectedness predicting identity as a medical educator based on a systematic review.[2] We then developed a model that included the addition of identity as a medical educator predicting openness to improve. We tested our hypothesis with CFA and SEM, determining the best fit model for TF and SF.

For our hypothesis, we proposed that connectedness and appreciation would predict identity as a medical educator, which would then predict openness to improve. The hypothesised model was the best fit for the SF population (Fig. 4); we noted, though, that connectedness and appreciation predicted identity as a medical educator fairly weakly. However, when we applied our model to TF, the structural path model required modification for best fit. Specifically, we obtained a better-fit model with appreciation predicting both identity as a medical educator and openness to improve, identity

as a medical educator predicting an openness to improve, and connectedness trending towards predicting openness to improve directly (Fig. 3).

Theoretical implications

Our findings may contribute to theory in several ways. First, in both the SF and TF models, there was a relationship between identity as a medical educator and openness to improve, as hypothesised. Regardless of type of teacher, an open attitude towards improving their teaching was higher when the faculty members rated their identity as a medical educator higher. These results appear to support the importance of FD efforts to develop ways to strengthen the identity of faculty members as medical educators as a way to improve teaching. This finding is consistent with the findings from other research studies.[7,19,24]

Second, we have provided support for the idea that identity as a medical educator and openness to improve can be predicted partially by a sense of appreciation and connectedness with the department. However, the fact that our models were different for TF and SF would suggest that the relationships between the factors of appreciation, connectedness, identity as a medical educator and openness to improve differ for SF and TF. In response, a different focus may be needed when designing FD for these populations.

Specifically, we may consider the direct work environment of each of the populations and what it means to 'be in community' in order to explore the results and possible implications suggested by these models. Contrary to our initial hypothesised model in which connectedness predicted identity as a medical educator, the TF model data suggested a direct relationship between connectedness and openness to improve. We suggest that this result, in part, reflects the importance of the direct work environment and community that TF experience in their department, as suggested in the literature.[2] In a supportive teaching community within a department, teachers may be secure in their identity because teaching is valued. We suggest that connectedness in this context is more about good relationships within the environment, freeing the teacher to focus on reflection, discussion, learning and working alongside other teachers without feeling threatened. Feldman and Paulsen[15] name 'supportive, effective department chairs' and 'frequent interaction, collaboration, and community among faculty' as two of the eight essential characteristics of a culture that supports teaching and improvement. Faculty learning communities provide similar support and have been associated with improved teaching.[43] The importance of informal support is confirmed in multiple studies on the transition from various types of health care practitioners to medical educators.[3,4,44] Our results would also suggest that a lack of connectedness within a department might limit this openness to improve.

In the TF model, we confirmed the hypothesis that appreciation for trying a new teaching method would predict identity as a medical educator directly, which predicted openness to improve. However, identity as a medical educator was not considered a full mediator between appreciation and openness to improve, a result that may have been affected by the fact that the prompt for our appreciation scale asked what would motivate the educator to try a new teaching method. This emphasis on trying a new teaching method might explain why we saw a direct effect of appreciation on openness to improve as well as on identity as a medical educator. A good demonstration of this effect was reported in a study by Adler et al.,[45] who showed that modest grants given by a medical school for innovative teaching not only created innovative, enduring programmes and laid the foundation for subsequent projects, but also promoted educators' professional identity. Lack of academic recognition and funding continue to be major challenges for medical educators.[26] Our results reinforce the idea that when good teachers are appreciated and recognised for their teaching, their identity as a medical educator is strengthened and they become more open to methods to improve teaching. Interestingly, researchers investigating the impact of the establishment of a teacher community within a health science school found increases in both a sense of connectedness and competence but not in a sense of appreciation.[9] Together with our model, these results would suggest that this recognition and appreciation may need to come from outside the local teaching community (e.g. from the university, medical community or society) in order to have it predict teachers' identity as a medical educator.[2,44,46] In summary, our TF model suggests that appreciation predicts identity as a medical educator, whereas connectedness within a department and appreciation predict on openness to improve for TF.

For SF, the direct work environment may also affect their identity as a medical educator. Our results suggest that their sense of connectedness and appreciation have some predictive value for their identity as a medical educator, but that their value

is fairly weak. We feel that this can be partially explained by some SF defining their work environment as the place where they are a clinician. Consequently, they would look for their sense of appreciation and connectedness as a 'clinician who teaches'[29] within their hospital or clinic. Alternatively, SF who realise they want to or need to develop as medical educators may turn to their teaching community within the respective department to validate their identity, as suggested in the SF model. However, their limited experience of connectedness to and appreciation from that teaching community as an SF ('I do not belong', 'I have limited contact with faculty', 'there is a lack of institutional engagement', 'I am excluded', 'I am invisible', and 'I am an outsider')[13,47,48] has the potential to hinder their identity as teachers. We feel that both these explanations (identity from their clinician role and lack of appreciation and a teaching community) may have some value in explaining the limited value of connectedness and appreciation in predicting identity as a medical educator in our SF model. Results reported in a article on this same sample of teachers demonstrated that the SF rated their identity as a medical educator at a level similar to the TF.[30] Given this result, we would speculate that SF may rely more heavily on a sense of competence (as a health care professional) and commitment to students for their teacher identity.[2]

We might speculate that the SF model is an underdeveloped TF model, being similar to what is seen in the early teaching years of health care faculty in general, where new medical educators rely on their clinical expertise initially for their identity as a teacher.[3–6] Browne and Webb[44] suggest that teachers need to make a conscious transition to be a medical educator by committing to acquiring and maintaining expertise in medical education, which may be difficult if clinicians do not see themselves as teachers. Riveros-Perez and Rodriques-Diaz[6] questioned whether clinicians are aware of this need for a conscious transition. In addition, Murray et al.[5] point out that universities also wrongly assume that being a senior clinician prepares someone for the academic world. If the SF model is an underdeveloped TF model, our results might suggest a possible continuum from clinician to medical educator,[6] where, as expertise in medical education is gained, appreciation for teaching may become more relevant to identity and openness to improve, whereas connectedness may become less about teacher identity and more about the relationship within a community of teachers.

Practical implications

Both the SF and TF models identified the importance of identity as a medical educator as a predictor of openness to improve by reflection and using diverse teaching methods. Therefore, one implication may be addressing ways to increase faculty members' identity as a medical educator to lead to more openness to improve. Researchers have documented that an individual's identification with a domain like teaching can be increased by increasing their perceptions of five motivational constructs, namely, empowerment, usefulness, success, interest and caring, in their work environment;[38,49] therefore, it may be possible to implement strategies to increase these perceptions for SF and TF in order to increase their openness to improve (see Jones[50] for specific strategies).

Our results suggest that TF may improve their teaching methods if they experience a positive teaching environment that includes a sense of connectedness within their department. To encourage this, experienced teachers could be asked to assist other teachers in reflecting on their teaching methods and possibly adopting some new methods. Authors of a systematic review of FD initiatives reported that over 30% of studies found that supportive relationships with other health science colleagues, as a form of community building, contributed to both individual and shared success in improving teaching methods.[24] Universities could consider taking active steps to develop communities of practice within departments so that quality teaching is supported and celebrated. Our results also suggest that appreciation shown to TF may strengthen their identity as a medical educator and openness to improve. An international survey of medical educators identified a lack of academic recognition as a major challenge[26] and negative opinions persist within medicine about medical educators.[46] Results from our exploratory study suggest that making efforts to build teacher connectedness within a department and appreciate good teaching will predict TF openness to reflection and diverse teaching methods and may, ultimately, benefit students.

Results from our SF findings supported our original hypothesis and model, and we speculated that the differing and weaker relationships when compared to TF might be a result of the SF not having moved as far on the continuum from clinician to medical educator. If we assume that identity as a medical educator is a desired construct and acts as a mediator between perceived connectedness and openness to improve in

our SF population, we suggest that some strategies recommended for new medical educators could be utilised with SF. First, universities may need to recognise the challenges of the transition from clinician to medical educator and support SF through the transition.[5] Second, SF who base their value as a teacher in their clinical skills may need to be made aware through education of their need for pedagogy about learning principles to increase their competence and credibility as a teacher.[6,44] Third, SF could benefit from being able to access knowledge and skills relevant to their teaching through convenient FD, possibly progressing them towards becoming a medical educator.[51] Finally, SF who rate their connectedness with the teacher community lower may be supported by developing (or including them in) FD communities that increase their connectedness to the respective department.[13] We suggest that implementing these changes may move SF on the continuum towards a more developed model of a medical educator, which may benefit students.

Limitations and future research

The results were obtained from only one health science school, and thus, it may not be possible to generalise them to all health science schools. However, the importance of connectedness and appreciation in faculty members' identity is well supported in the literature,[2] which suggests that our exploratory findings may contribute to the ongoing identity discussion. We used a validated 'identification with teaching' scale to measure identity as a medical educator but acknowledge that there is active discussion about differences between identifying with a profession and professional identity.[52] However, our belief is that the scale partially encompasses both the personal and sociocultural aspects associated with identity. Although we considered our TF sample fairly representative of the population with respect to demographics, we had limited knowledge about how representative our SF sample was of the actual population because we had difficulty contacting SF for participation in the study. However, both sets of demographics showed a good representation of disciplines, age groups and gender. We also acknowledge that our TF sample size (n = 73) was less than the recommended minimum of five participants per estimated parameter[53] and much less than other estimates of 10 per parameter[54] or a minimum of 200, as recommended in the literature.[55] However, we believed that the contrast between the SF and TF models was of interest to explore. In addition, we justified the use of smaller groups because our TF sample was small to begin with (n = 212), our TF response rate was reasonable (37%) compared to other needs assessments, our model was simple, all loadings were fixed to 1, and our correlations were strong.[56] Future research could include testing the models across multiple health science schools and using larger sample sizes. There might also be a benefit to investigating the results further with qualitative studies to explain teachers' experiences with connectedness and appreciation.

CONCLUSIONS

Our exploratory study examined a model in which connectedness and appreciation predicted identity as a medical educator and openness to improve. We found some support for this model, but we found variations in the model when comparing SF and TF. We speculated that the differences found might reflect the progression of a clinician to a medical educator and explored ideas that might be utilised to direct faculty development initiatives for these two different groups of faculty members. Based on our findings, we would suggest the following: (i) increasing appreciation for TF when they make efforts to improve their teaching; (ii) developing teaching communities within departments for TF; (iii) increasing awareness of and resources for the transition to medical educator for SF; (iv) increasing connection to departments for SF; (v) incorporating SF into teaching communities, and (vi) implementing FD that enhances identity as a medical educator. Further research is needed to find ways to encourage increased identity as a medical educator and improvement in teaching methods for all types of faculty members.

Contributors: AGS was primarily responsible for the conception and design of the work, the acquisition, analysis and interpretation of the data, the initial drafting of the work, incorporating the revisions suggested by the other authors (ABS, BDJ and TS), and the final approval of the version to be published. ABS was also a primary contributor to the conception and design of the work, the analysis and interpretation of the data, the revisions made, and the final approval of the document. BDJ contributed to the design of the work as well as the analysis and interpretation of the data. BDJ also contributed to revisions and approved the version to be published. TS contributed to the analysis and interpretation of the work, contributed to revisions and also approved the final version. All authors (AGS, ABS, BDJ and TS) agreed to be accountable for all aspects of the work.
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Ethical approval: the National BioEthics Committee indicated there was no need for their approval given the nature of the collected data. We announced the project to the Icelandic National Data Protection Authority, who publicised the project as per Icelandic regulations.

REFERENCES

1 Rodgers CR, Scott KH. The development of the personal self and professional identity in learning to teach. In: Cochran-Smith M, Feiman-Nemser S, McIntyre DJ, eds. *Handbook of Research on Teacher Education: Enduring Questions in Changing Contexts*. New York, NY: Routledge/ Taylor & Francis Group 2008;732–55.
2 Van Lankveld T, Schoonenboom J, Volman M, Croiset G, Beishuizen J. Developing a teacher identity in the university context: a systematic review of the literature. *High Educ Res Dev* 2017;**36** (2):325–42.
3 Duffy R. Nurse to educator? Academic roles and the formation of personal academic identities. *Nurse Educ Today* 2013;**33** (6):620–4.
4 Hurst KM. Experiences of new physiotherapy lecturers making the shift from clinical practice into academia. *Physiotherapy* 2010;**96** (3):240–7.
5 Murray C, Stanley M, Wright S. The transition from clinician to academic in nursing and allied health: a qualitative meta-analysis. *Nurse Educ Today* 2014;**34** (3):389–95.
6 Riveros-Perez E, Rodriques-Diaz J. The journey from clinician to undergraduate medical educator involves four patterns of transformation. *Adv Med Educ Pract* 2018;**9**:7–15.
7 Lieff S, Baker L, Mori B, Egan-Lee E, Chin K, Reeves S. Who am I? Key influences on the formation of academic identity within a faculty development program. *Med Teach* 2012;**34** (3):e208–15.
8 Love LM, Haggar FL, McBrien SB, Buzalko RJ, Hartman TL, Shope RJ, Beck Dallaghan GL. Supporting the professional identity of medical science educators: understanding faculty motivations for quality improvement in teaching. *Med Sci Educ* 2018;**28** (4):655–65.
9 Van Lankveld T, Schoonenboom J, Croiset G, Volman M, Beishuizen J. The role of teaching courses and teacher communities in strengthening the identity and agency of teachers at university medical centres. *Teach Teach Educ* 2017;**67**:399–409.
10 Starr S, Ferguson WJ, Haley HL, Quirk M. Community preceptors' views of their identities as teachers. *Acad Med* 2003;**78** (8):820–5.
11 Steinert Y, Macdonald ME. Why physicians teach: giving back by paying it forward. *Med Educ* 2015;**49** (8):773–82.
12 O'Sullivan PS, Irby DM. Identity formation of occasional faculty developers in medical education: a qualitative study. *Acad Med* 2014;**89** (11):1467–73.
13 Buch K, McCullough H, Tamberelli L. Understanding and responding to the unique needs and challenges facing adjunct faculty: a longitudinal study. *Int J Educ Res* 2017;**16** (10):27–40.
14 Beauchamp C, Thomas L. Understanding teacher identity: an overview of issues in the literature and implications for teacher education. *Camb J Educ* 2009;**39** (2):175–89.
15 Feldman KA, Paulsen MB. Faculty motivation: the role of a supportive teaching culture. *New Dir Teach Learn* 2002;**1999** (78):69–78.
16 Kane R, Sandretto S, Heath C. An investigation into excellent tertiary teaching: emphasising reflective practice. *High Educ* 2004;**47** (3):283–310.
17 Berman AC. Good teaching is good teaching: a narrative review for effective medical educators. *Anat Sci Educ* 2015;**8** (4):386–94.
18 Mann K, Gordon J, MacLeod A. Reflection and reflective practice in health professions education: a systematic review. *Adv Health Sci Educ Theory Pract* 2009;**14** (4):595–621.
19 Stone S, Ellers B, Holmes D, Orgren R, Qualters D, Thompson J. Identifying oneself as a teacher: the perceptions of preceptors. *Med Educ* 2002;**36** (2):180–5.
20 Al Maghraby M, Alshami A. Learning style and teaching method preferences of Saudi students of physical therapy. *J Family Community Med* 2013;**20** (3):192–7.
21 Rognvaldsson S. Personal communication. 2016.
22 Schmidt HG, Wagener SL, Smeets GACM, Keemink LM, van der Molen HT. On the use and misuse of lectures in higher education. *Health Prof Educ* 2015;**1** (1):12–8.
23 Condon W, Iverson ER, Manduca CA, Rutz C, Willett G. *Faculty Development and Student Learning: Assessing the Connections*. Bloomington, IN: Indiana University Press 2016.
24 Steinert Y, Mann K, Anderson B *et al.* A systematic review of faculty development initiatives designed to enhance teaching effectiveness: a 10-year update: BEME Guide No. 40. *Med Teach* 2016;**38** (8):769–86.
25 Bond N. Developing a faculty learning community for non-tenure track professors. *Int J High Educ* 2015;**4** (4):1–12.
26 Huwendiek S, Mennin S, Dern P, Ben-David MF, van der Vleuten C, Tonshoff B, Nikendei C. Expertise, needs and challenges of medical educators: results of an international web survey. *Med Teach* 2010;**32** (11):912–8.
27 Schiekirka-Schwake S, Anders S, von Steinbüchel N, Becker JC, Raupach T. Facilitators of high-quality teaching in medical school: findings from a nation-wide survey among clinical teachers. *BMC Med Educ* 2017;**17** (1):178.
28 Valle M, Fuchs T. Teaching and learning communities: empowering adjuncts and ensuring quality. *J Educ Hum Dev* 2015;**4** (1):1–6.

29 Taylor EW, Tisdell EJ, Gusic ME. Teaching beliefs of medical educators: perspectives on clinical teaching in pediatrics. *Med Teach* 2007;**29** (4):371–6.
30 Snook AG, Schram AB, Sveinnson T, Jones BD. Needs, motivations, and identification with teaching: a comparative study of adjunct/sessional and tenure-track faculty. Under Review.
31 Artino AR, La Rochelle JS, Dezee KJ, Gehlback H. Developing questionnaires for educational research: AMEE Guide No. 87. *Med Teach* 2014;**36** (6):463–74.
32 Jones BD, Paretti MC, Hein SF, Knott TW. An analysis of motivation constructs with first-year engineering students: relationships among expectancies, values, achievement, and career plans. *J Eng Educ* 2010;**99** (4):319–36.
33 Jones BD, Ruff C, Osborne JW. Fostering students' identification with mathematics and science. In: Renninger KA, Nieswandt M, Hidi S, eds. *Interest in Mathematics and Science Learning*. Washington, DC: American Educational Research Association 2015;331–52.
34 Behar-Horenstein L, Garvan C, Catalanotto F, Hudson-Vassell C. The role of needs assessment for faculty development initiatives. *J Fac Dev* 2014;**28** (2):75–86.
35 Schönwetter DJ, Hamilton H, Sawatzky JV. Exploring professional development needs of educators in the health sciences professions. *J Dent Educ* 2015;**79** (2):113–23.
36 McGoldrick B, Watts JS, Economou K. *U.S. Postsecondary Faculty in 2015: Diversity in People, Goals and Methods, But Focused on Students*. Washington, DC: FTI Consulting Available at http://postsecondary.gatesfoundation.org/wp-content/uploads/2015/02/US-Postsecondary-Faculty-in-2015.pdf [Accessed 30 August 2018.]
37 Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine* 2000;**25** (24):3186–91.
38 Jones BD, Osborne JW, Paretti M, Matusovich H. Relationships among students' perceptions of a first-year engineering design course and their engineering identification, motivational beliefs, course effort, and academic outcomes. *Int J Eng Educ* 2014;**30** (6A):1340–56.
39 Tendhar C, Singh K, Jones BD. Using the domain identification model to study major and career decision-making processes. *Eur J Eng Educ* 2018;**43** (2):235–46.
40 Iacobucci D. Everything you always wanted to know about SEM (structural equations modeling) but were afraid to ask. *J Consum Psychol* 2009;**19** (4):673–80.
41 Hu LT, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct Equ Modeling* 1999;**6** (1):1–55.
42 Sobel ME. Asymptotic confidence intervals for indirect effects in structural equation models. *Sociol Methodol* 1982;**13**:290–312.
43 Vesico V, Ross D, Adams A. A review of research on the impact of professional learning communities on teaching practice and student learning. *Teach Teach Educ* 2008;**24** (1):80–91.
44 Browne J, Webb K, Bullock A. Making the leap to medical education: a qualitative study of medical educators' experiences. *Med Educ* 2017;**52** (2):216–26.
45 Adler SR, Chang A, Loeser H, Cooke M, Wang J, Teherani A. The impact of intramural grants on educators' careers and on medical education innovation. *Acad Med* 2015;**90** (6):827–31.
46 Sabel E, Archer J. "Medical education is the ugly duckling of the medical world" and other challenges to medical educators' identity construction: a qualitative study. *Acad Med* 2014;**89**:1474–80.
47 Bunton SA, Corrice AM. An *Exploration of Part-Time U.S. Medical School Faculty: A Thematic Overview*. Washington, DC: Association of Amercian Medical Colleges 2011.
48 Jolley MR, Cross E, Bryant M. A critical challenge: the engagement and assessment of contingent, part-time adjunct faculty professors in United States community colleges. *Community Coll J* 2014;**38** (2–3):218–30.
49 Osborne JW, Jones BD. Identification with academics and motivation to achieve in school: how the structure of the self influences academic outcomes. *Educ Psychol Rev* 2011;**23** (1):131–58.
50 Jones BD. *Motivating Students by Design - Practical Strategies for Professors*, 2nd edn. Charleston, SC: CreateSpace 2018.
51 McAndrew M. Community-based dental education and the importance of faculty development. *J Dent Educ* 2010;**74** (9):980–5.
52 Miscenko J, Day DV. Identity and identification at work. *Organ Psychol Rev* 2016;**6** (3):215–47.
53 Bentler PM, Chou C-P. Practical issues in structural modeling. *Sociol Methods Res* 1987;**16** (1):78–117.
54 Nunnally JC. *Psychometric Theory*. New York, NY: McGraw-Hill 1967.
55 Boomsma A. Nonconvergence, improper solutions, and starting values in lisrel maximum likelihood estimation. *Psychometrika* 1985;**50** (2):229–42.
56 Kenny DA. *Measuring Model Fit* 2015. Available at http://davidakenny.net/cm/fit.htm. [Accessed 25 April 2019.]

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article:

Data S1. Flow diagram from pilot testing to sample, Sample distribution table and Scales and items table.

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