An Insight into Professional Identity Formation: Qualitative Analyses of Two Reflection Interventions During the Dissection Course

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The professional behavior of future doctors is increasingly important in medical education. One of the first subjects in the curriculum to address this issue is gross anatomy. The Tuebingen Medical Faculty implemented a learning portfolio and a seminar on medical professionalism during the dissection course. The aims of this research project are to get an overview of how students form a professional identity in the dissection course and to compare the content of both their oral and written reflections on the course. A qualitative analysis was conducted of the oral and written reflections on the dissection laboratory experience. This study was conducted during winter term 2013/2014 with a cohort of 163 participants in the regular dissection course. Written reflection texts (from n = 96 students) and audio recordings from four oral reflection seminar discussions (with n = 11 students) were transcribed and deductively categorized with Mayring’s qualitative content analysis method. Both qualitative analyses show that students reflected on many topics relevant to professional development, including empathy, respect, altruism, compassion, teamwork, and self-regulation. Quantitative analysis reveals that students who attended the oral reflection wrote significantly more in their written reflection than students who did not. There is, however, no difference in the reflection categories. Reflection content from students corresponds with categories derived from existing competency frameworks. Both the seminar (oral reflections) and the learning portfolio (written reflections) present excellent opportunities to foster professional development during anatomy education; the key is using them in conjunction with the dissection course. Anat Sci Educ 13: 317–329. © 2019 The Authors. Anatomical Sciences Education published by Wiley Periodicals, Inc. on behalf of American Association of Anatomists.

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INTRODUCTION

The proper delivery of medical education should result in educating good doctors: this premise has not changed much over the past century (Drake, 2014). However, the objectives, and the means to achieve these objectives, have changed significantly in recent decades. Perhaps the greatest paradigm shift occurred when the medical curricula were redesigned from mere content to competencies. In the United States and Canada, this movement began early (McGaghie et al., 1978; Williams, 1980), reached a broad audience with the introduction of the CanMEDS framework (Frank, 2003) and the ACGME outcome project (Swing, 2007), and led to the replacement of the subject-based USMLE content outlines with the ACGME core competencies (NEJM Knowledge + Team, 2018). In Germany, this development began only recently (Hahn and Fischer, 2009), with the subject content outlines (Gegenstandskataloge, or GK) being superseded by the National Competency-based Learning Objective Catalogue just a few years ago (NKLM, 2015).

The changes from content to competencies paved the way for integrating medical professionalism into the curriculum. In contrast to “content,” the broader term “competency” incorporates a more holistic approach to learning outcomes, as a competency includes knowledge, skills, and attitudes, as well as the application of these components (Maudsley and Strivens, 2000a).

Adopting competence-based education was a major challenge for traditional institutions, especially anatomy departments, which usually excel in delivering hard facts and complex functional interrelations. Before the above-mentioned changes, competencies subsumed under medical professionalism were often categorized as “hidden curriculum” (Bandini et al., 2017), which—by the definition of the term—erroneously implied that they were not taught. Nevertheless, students have learned professional behavior in anatomy classes anyway, even if they were not explicitly taught it (Netterstrør and Kayser, 2008). This is primarily because many of these competencies are experienced and absorbed through role modeling (Warner and Rizzolo, 2006; Brainard and Brislan, 2007; Goldie et al., 2007). In this context, anatomy can play a crucial role, since anatomy is in many curricula the first experience of a “medical” discipline (Palbst and Rothkotter, 1997; Gunderman and Wilson, 2005; Lachman and Pawlina, 2006), even more so if students experience anatomy in a dissection course. The first contact with a cadaver can lead students to reflect on their future role as physicians, the role of death and dying in the medical profession, the vulnerability of the human body, and accountability for one’s actions (Hilton and Slotnick, 2005; Slotnick and Hilton, 2006; Warner and Rizzolo, 2006).

From an educator’s perspective, the problem with a “hidden curriculum” is that, by definition (Hafferty, 1998), the learning process and outcomes cannot be directly influenced. As a result, many medical faculties have begun to explore concepts and explicit teaching interventions that can convey professional attitudes and behavior. With mounting evidence from scientific studies, it is now widely acknowledged that fostering self-reflection in medical students is an appropriate way to teach professionalism (Maudsley and Strivens, 2000b; Mann et al., 2009; Sandars, 2009). The underlying theoretical framework refers back to the work of Donald Schön, who defined the “reflective practitioner” as a concept for professional practice (Schön, 1983). Based on the assumption that meta-skills are the bases for professional practice, Schön described a mode of action where professionals demonstrated the ability to adjust their actions through reflection in the respective situation (reflection-in-action). This is mainly a constructivist approach, as the professional practitioner is seen to construct reality through his or her actions. A reflection on one’s own values, convictions, and expectations requires that the often unconscious (implicit) subjective theories have to first be made explicit, that is, conscious (Meyer, 2001). This is the prerequisite for subsequent reflection (reflection-on-action). Reflective practice can be seen as the key component for competency-based learning (Mandl et al., 2002), where students are regarded as reflective practitioners. Anatomy education has a tremendously powerful environment at hand to teach professionalism in the dissection course (Lachman and Pawlina, 2006; Swartz, 2006; Ghosh and Kumar, 2019). However, it is not enough to rely on professional values seeping unaided into student brains (Netterstrom and Kayser, 2008), without addressing emotional aspects, such as attitudes toward death, rendering adverse effects (Charlton et al., 1994); thus, confrontation with a body donor must be approached carefully (Böckers, 2015). As mentioned above, a “hidden curriculum” is not enough, as students have to become consciously aware of their values and beliefs to be able to reflect on their actions. The American College of Physicians’ (ACP) position paper on this topic aptly states: “Making the hidden visible and the implicit explicit helps to create a culture reflecting medicine’s core values” (Lehmann et al., 2018).

The Tuebingen Medical Faculty addresses professionalism and reflective practice with first-year undergraduate students during the dissection course, as this is usually the first time that students truly realize that they are becoming physicians. The dissection course is a mandatory experience involving a confrontation with an entrusted patient and death. To foster reflection and to explicitly teach professional behavior during the course, a voluntary seminar on medical professionalism was introduced (Shiozawa et al., 2016). The seminar gives medical students the opportunity to open up, in a closed and secure environment, about their thoughts and ideas concerning professional behavior in the dissection laboratory. The seminar is voluntary, and approximately 35%–50% of each cohort takes advantage of the offer. The seminar comprises two sessions: the first at the beginning of the course (T1), and the second approximately two thirds of the way through the course (T2). To accomplish the learning goals of the seminar, a conversation guide was implemented to help lead the reflective discussions (Shiozawa et al., 2016).

At the same time that the seminars were introduced, an obligatory learning portfolio was implemented (Giese et al., 2015). The portfolio documents the longitudinal process of students developing their roles and competencies during the first 5 years of the medical curriculum, based on the competency framework of the NKLM (2015). It includes a reflection task during the dissection course in the first year concerning the individual’s role as a medical professional. The written reflections also serve as a formative assessment, since the portfolio is reviewed and discussed with faculty mentors. Students must receive a ”pass” (i.e., grade A, B, or C) to be admitted to the First State Examination.

Several articles have discussed professional identity formation during the dissection course. However, these papers describe the historical perspective of professionalism training (Warner and Rizzolo, 2006; Pawlina, 2006), the theory behind professionalism (Lachman and Pawlina, 2006; Slotnick and Hilton, 2006), the curricular implications (Escobar-Poni and Poni, 2006; Swartz, 2006), quantitative data on student activity during dissection (Winkelmann et al., 2007), quantitative
data on attitude change or reflective capacity (Camp et al., 2010; Pearson and Hoagland, 2010; Stampinato et al., 2014), or distress and coping strategies (Böckers, 2015; Sandor et al., 2015). One qualitative study reports on students’ perceptions and the covert learning outcomes of dissection (Lempp, 2005), but in this curricular program professional identity formation or reflective practice was not taught with an explicit teaching intervention. Overall, none of these investigations present data on what students actually value, feel or believe during dissection, and what goes on in their minds that may contribute to forming their professional identity.

Having implemented two different tools (oral and written reflections) for students to help them develop a professional identity, this project seeks to apply a qualitative research design to gain insight into the reflective practice of medical students. This study aims to achieve the following tasks. First, the study seeks to establish a general overview of how students learn medical professionalism in the dissection course and what reflection content students are concerned with (by building categories). This may provide evidence that professional identity formation actually takes place with the implemented interventions. Second, the study will compare the qualitative content of both reflection formats—oral and written, to see whether reflective practice or reflective content differs in either format, and whether the reflections are voluntary (oral) or mandatory (written) makes any difference. The discovered categories will furthermore be set in relation to existing frameworks on professionalism, to see if the reflection content is valid for professional identity formation.

**MATERIALS AND METHODS**

This study was conducted in the curricular course on gross anatomy at the Medical Faculty of the University of Tuebingen and followed a qualitative design, abstracting categories from seminar discussions (oral reflections), and portfolio excerpts (written reflections). The study was approved by the ethics committee of the Tuebingen Medical Faculty (No.194/2012BO1).

**Curriculum**

Most medical faculties in Germany run a traditional curriculum, which is statutory by federal law (Ärztlche Approbationsordnung). Students admitted to universities are high school graduates; there are no graduate entry programs as in the United States. Two years of basic sciences (mainly anatomy, physiology, and biochemistry) are followed by 3 years of clinical education. The sixth and last year is the so-called practical year, where students are integrated full-time into hospital wards and outpatient clinics. Three state examinations are mandatory, one each coming after the second, fifth, and sixth years.

The anatomy curriculum at Tuebingen University takes place in the first 2 years, which are again divided into two terms each. In the first term, students may attend the introductory anatomy lecture and have to pass two oral examinations to get admitted to the dissection and histology courses. The latter take place either in the second or third term. Fourth term completes the anatomy curriculum with a neuroanatomy course. Additionally, the Medical Faculty has implemented several longitudinal curricula, one of them being the learning portfolio with reflection tasks on the roles of a doctor.

**Dissection Course**

The dissection course is part of the mandatory undergraduate medical curriculum in second or third term. It takes place yearly from October to December; it is held three times a week, with a group of 10 students per dissection table guided by a student tutor, and an experienced anatomist for every two tables. Students spend 96 academic hours with active whole body dissection in the laboratory. Accompanying lectures on regional and functional anatomy comprise 47 hours. Additionally, students partake in eight clinical anatomy seminars in contextual alignment with the “Sectio chirurgica” live stream transmissions (Hirt et al., 2010) and have access to radiologic CT images of the specimen. Reflective seminar discussions, as described above, are voluntary and thus not part of the course assessment. To complete the course successfully, students have to pass three oral examinations at their dissected specimen, and two written examinations containing standard and clinically applied multiple-choice questions. Written reflection tasks of the learning portfolio are mandatory and are given at the start of each term. The due date is about 2 weeks after the end of the dissection course. Assessment of the written reflection is not incorporated into the grades of the dissection course and is instead counted as part of the longitudinal module on doctors’ roles.

**Student Cohort**

Each term, 163 students are admitted to study medicine at the Medical Faculty Tuebingen. Participation in the dissection course and the learning portfolio exercises are mandatory, whereas the accompanying seminar discussions (from which the oral reflection data stem) is voluntary; accordingly, the two study samples are described separately. Student identities were pseudonymized and given a personal numerical code. These pseudonyms allowed the analysts to connect written and oral reflections. All students included in this study gave their written consent to the analysis of their oral and written reflections.

**Oral Reflections**

During the dissection course of winter term 2013/2014 at the Medical Faculty of Tuebingen, 63 students voluntarily participated in a seminar series accompanying the dissection course. The oral reflections were dedicated to the issue of professionalism in medicine, with the first session (T1) dealing with the immediate impact of dissection after the first week of the course, and the second session (T2) focusing on habituation and changes over time after seven weeks of dissection. Both sessions were led by experienced student tutors. The oral reflections of both sessions were audio recorded.

Participants were divided into groups of five to seven students. The group size was limited in order to ensure a productive and secure atmosphere for the students (Shiozawa et al., 2016). For the analysis, seminar groups were only included when (1) all students of a group attended both classes of the seminar and (2) the same student tutor led both classes. The inclusion criteria were established in order to obtain consistent data (participation at both seminar classes) and to eliminate possible biases (different tutors). This process meant that two seminars with five and six participants, respectively, were available for the analysis (n = 11; 4 males, 7 females, mean age 20.27 ± 1.42 years).
Written Reflections

During the same term (winter 2013/2014), all students partaking in the dissection course were obliged to hand in the written reflection task \((n = 163)\). Written reflections run approximately two pages per term and answer reflective questions on the study progress and on ongoing personal and academic development; these are then discussed with a faculty mentor.

From teaching experience and previous research (Shiozawa et al., 2016), two possible confounders for selection biases were identified. One factor which is known to notably impact experiential learning and reflection in the dissection course is prior education or work experience in allied health professions (Shiozawa et al., 2016). Although allied health professions might share many similar values and ethics, the professional self-conception differs and doctors are delimited, which requires students to learn a different set of professional competencies. Due to the specific admission process at Tuebingen University, this applies to approximately 50% of the medical students. As this effect was observed in the reflection seminars (Shiozawa et al., 2016), it was decided to differentiate two cohorts (students with or without prior education/work practice) and analyze them separately for the written reflections. The second confounding variable that was deemed necessary to control was participating in the oral reflections.

As a result of these factors, the written reflection texts were sorted into four groups, according to the variables “prior education/work experience” and “seminar attendance,” as follows:

- **Group 1:** Students with prior education or work experience in allied health professions who attended the seminar \((n = 25); 16\) females, 9 males, mean age 22.58 ± 2.34 years).
- **Group 2:** Students without prior education or work experience in allied health professions who attended the seminar \((n = 24); 14\) females, 10 males, mean age 20.85 ± 1.86 years).
- **Group 3:** Students with prior education or work experience in allied health professions who did not attend the seminar \((n = 23); 14\) female, 9 males, mean age 21.46 ± 2.98 years).
- **Group 4:** Students without prior education or work experience in allied health professions who did not attend the seminar \((n = 24); 14\) females, 10 males, mean age 23.17 ± 2.55 years).

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Table 1.

| Characteristics of Student Cohort (2013/2014) and Study Sampling |
|---------------------------------------------------------------|
| **Grouping**                                                 | **Seminar Discussions/Oral Reflection** |
| Participation Manditory \(n = 163\)                         | Voluntary \(n = 63\)                  |
| Study sample Four groups \(n = 96\)                         | Two seminars \(n = 11\)               |
| Group 1: Students with prior education or work experience in allied health professions who attended the seminar \(n = 25\) 16 females, 9 males mean age 22.58 ± 2.34 years) | \(n = 11\) 7 females, 4 males mean age 20.27 ± 1.42 years |
| Group 2: Students without prior education or work experience in allied health professions who attended the seminar \(n = 24\) 14 females, 10 males mean age 20.85 ± 1.86 years) | \(n = 11\) 7 females, 4 males mean age 20.27 ± 1.42 years |
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| Group 4: Students without prior education or work experience in allied health professions who did not attend the seminar \(n = 24\) 14 females, 10 males mean age 23.17 ± 2.55 years) | \(n = 11\) 7 females, 4 males mean age 20.27 ± 1.42 years |

Whole 2013/2014 student cohort \((n = 163); 99\) females, 63 males; mean age 22.03 ± 2.59). Due to prior education/work experience in allied health professions, written reflection participants in Groups 1 and 3 were significantly older than those in Groups 2 and 4 (two-tailed t-test, \(P < 0.05\)).

Prompts for Oral and Written Reflections

The conversation guide used for the oral reflections has been published previously (Shiozawa et al., 2016). Table 2 summarizes the questions for guiding the conversation. The wording of the task for the written reflection is provided in Table 3.

Transcription

The audio recordings of the seminars (oral reflections) were transcribed verbatim and were typed into Microsoft Word 2007 (Microsoft Corp., Redmond WA). Data were pseudonymized
Qualitative Content Analysis

For the analysis of the oral and written reflection transcripts, data were transferred into the qualitative analysis software MAXQDA, version 11 (VERBI Software GmbH, Berlin, Germany).

Quantitative Data

Mayring’s qualitative-oriented content analysis also implies the application of quantitative analysis tools such as frequency comparison or correlation analysis of the qualitative data (Mayring, 2015). In the present data, the number of citations is used to estimate the volume of each student’s reflection. Statistical data analysis (mean values, associated standard deviations, and frequencies and percentages of relevant factors like age, gender, and approach) was performed using SPSS statistical package, version 24 (IBM Corp., Armonk, NY). Group comparisons were calculated with t-test, and a P value < 0.05 was considered statistically significant.

Translation

The oral and written reflections were originally given in German. For the purpose of this publication, citations were translated verbatim into English as accurately as possible by the authors, trying to capture both the statements and their implications.

RESULTS

Aim 1: Gain a General Overview of How Students Learn Medical Professionalism in the Dissection Course and What Reflection Content Students are Concerned With

Oral reflections. Data from two seminars (with two sessions each) were transcribed (n = 11 students and n = 2 student tutors), resulting in four transcripts (one for each session). The total time of the sessions was 213 minutes. On average, each speaker contributed 19.64 (±7.24) minutes. For the first session (T1), 320 citations could be assigned to 4 main categories, 51 subcategories, and 164 subgroups. For the

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Table 2.
Reflection Prompts Used for the Seminar Discussions

| Reflection prompts for the oral reflection |
|------------------------------------------|
| - What do you expect from the seminar?   |
| - How did you feel at the first cut?     |
| - How did you feel when you first touched the cadaver? |
| - How did you perceive the behavior of your fellow students? |
| - What helped you in coping with the situation? |
| - What experiences and/or feelings do you associate with death and dying? |
| - What can you take along for the dissection course? |
| - What may you take along from this experience for your future medical practice? |

Reflection prompts used for the seminar discussions are based on Shiozawa et al. (2016). Original questions were phrased in German.

Table 3.
Reflection Task for the Written Reflection

| Reflection task for the written reflection |
|-------------------------------------------|
| Please write a short reflection on the dissection course. The following questions may help you: |
| - What expectations did you have prior to the dissection course? |
| - What alleviated/impeded the situation working with a human cadaver? |
| - Did the handling of the situation change over the time of the course? Did you notice a change in attitude? How would you judge this change for yourself? |
| - What surprised you most during the course? |
| - What impact does the dissection course have on your future working life and your medical practice? |
| - Did your attitude and thoughts towards death and dying change with the dissection course? |

Original questions were phrased in German.

as described above. Spoken names were removed. Quotations were allocated through voice and speech.
second session (T2), 194 citations could be assigned to 4 main categories, 27 subcategories, and 87 subgroups. The following paragraphs summarize the main categories, supported by pertinent quotations from the students’ remarks during the seminars. Students are numerically pseudonymized (Student 01, Student 02, etc.).

**Expectations.** The results in this category emerged exclusively from T1. The students stated that they were very curious for the dissection laboratory experience and longed to apply the theoretical knowledge they had learned. Interest outweighed nervousness, and several students expressed their respect for the course:

“So I noticed, [...] this is the course that I anticipated most in the pre-clinical time, [...] but also the one for which I had the most respect.” (Student 26)

“So I have to say, I did not really care about cutting, because I thought ‘this is going to be mega interesting, and I am curious what is underneath.’ Approaching this, with this mere curiosity, was a completely different experience.” (Student 11)

The dissection course was expected to be stressful. Some students feared they might faint in the dissection room and doubted their ability to work practically:

“I somehow was afraid. That could have been anything between ‘I [might] faint at the table’ and ‘I [will] have to go back to the first term.’” (Student 26)

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Previous experience in allied health professions clearly helped students cope with the first-contact situation in the dissection room.

**Experiences.** At the beginning of the course (T1), students expressed many different feelings, from disgust to unease to even anger:

“[…] and in between you still have the moment, […] when I went there and I thought that it nauseated me [...]” (Student 25)

“To look and see that 150 students are whittling on 20 cadavers like crazy. I had problems with that. Because I think this is a creepy prospect, what we do there [...]” (Student 21)

“[…] I think sometimes, and we have this obese cadaver, I caught myself getting angry, that everything takes so long, and that the others are further [...]” (Student 23)

**Table 4.** Categorical Tree for the Qualitative Analyses

| Hierarchy of categories | Category labeling | Examples |
|-------------------------|-------------------|----------|
| The highest level       | Main category (deductive) | e.g., expectation/apprehension/previous experience |
| Second highest level    | Subcategory (inductive) | e.g., previous experience |
| Third highest level     | Subgroup          | e.g., previous experience as paramedic; introductory lecture to dissection by an anatomist |
| Fourth highest level    | Citation           | e.g., “So, I know this from being a paramedic, we had a guy there who was more like a frequent flyer miles collector, and every time you saw him...” |

Categorical tree for the qualitative analyses is based on Mayring (2015).

Most notable for students was their habituation to the experience. The body donor became an object, and the student became fixated on the coursework:

“At some point you just sit down with this piece of an arm, and [you] start working and...” (Student 13); “...then you forget it” (Student 15); “Right, you just do your job” (Student 13)

“[…] you spend your time for hours on one area, and you don’t look up [at] what’s happening around you, and sometimes you forget that there’s a cadaver lying in front of you.” (Student 22)

However, students reflected on their actions and their surroundings; they noticed and discussed the behavior of their fellow students and their teachers.

“I noticed [changes] when I talked to others. For me it suddenly became normal, when I tell my family at home, ‘Oh, we have a dissection course. And that’s really fun.’ And then I notice that they might think that’s weird. And then I think: that is really weird somehow, and half a year ago I myself might have thought that’s weird. So I notice [...] something changed” (Student 25).

Furthermore, students were concerned about being respectful toward the body donor. They discussed what can be said in the presence of a cadaver.

“I think it is difficult, especially with humor, [because] you have to maintain a certain respect. [...] I find it difficult to draw a line, what’s allowed as to humor, and [...] what is morally justifiable in front of the [body donor], and what is too much. This is a fine line.” (Student 15)

“I think [...] when you make a joke about the body donor, and you notice that was too harsh even for yourself, then saying, ‘Hey guys, that was inappropriate,’ that is OK. You can always apologize [...] and I think it’s quite convenient that you can ‘ditch some word salad’ while you’re working.” (Student 11)

As the course progressed (T2), students became aware of their own transformations. This awareness was fostered by self-reflection, showing empathy with the body donor, and
using humor as a coping mechanism, but also by suppressing their emotions. Most helpful were the peer group and the student’s family.

“I have to say, I have at least befriended our cadaver. It is quite weird.” (Student 26) “But doesn’t that make things worse?” (Student 25) “On the contrary. [In the first term] it was strange, looking at the face, in the eyes, at the hands. What essentially makes a human. And now, when we’re at the table, I have of course looked at the face, and […] I can imagine the person very well as a human. I have a very accurate image of him, that he donated himself, and that’s OK with him. Therefore, it’s OK for me as well.” (Student 25)

“You have to remind yourself that there is a purpose to what we’re doing […], otherwise I find it unbearable how you break into the integrity of a human being.” (Student 21)

“I think we all have established a setting for ourselves where we can talk quite openly about everything. […] This [oral reflection] is not the first time we’re talking.” (Student 23)

Medical professionalism. At the beginning of the course (T1), students also reflected on the dissection course’s relevance to and impact on their professional development. They became aware of their self-regulatory processes, and how professional behavior might differ from compassionate communication with patients:

“[...] how you handle yourself with the questions: how to behave in the presence of an open corpse. How you convey this to others, and […] how you behave professionally in your occupational field.” (Student 24)

“I notice now when I’m working with the cadaver […] when I made a bandage as a nurse, I focused on the bandage, and after that I focused again on the patient. […] I did not ignore him [the patient], but I viewed the bandage as a bandage, and not as a human. And now I perceive the same when working with a cadaver, that I turn off several factors; and when I talk with my fellow students, I look more into the human factor.” (Student 26)

They discussed the need for self-regulation, in conjunction with the strains of being a doctor and society’s expectations of doctors.

“I think it’s short-sighted to leave everything up to oneself. There is also something society conveys, what you may have to prove to society […] And when a doctor comes home in the evening and cries on his wife’s shoulder, because he had an experience he could not cope with, that is completely OK in my eyes. But we do not like to hear [about] that.” (Student 21)

Points from the second session (T2) included inurement, the perception of their own empathic abilities, compassion, and the need for social competencies.

“It is important to maintain a balance. Complete inurement is not good. But you need some sort of inurement as self-protection. But I believe you should never forget compassion. […] Inurement for yourself, emotion and compassion for relatives.” (Student 26)

“It is up to you how much you identify with a [patient’s] problem. But what is conveyed outwardly has to comply with a certain norm. Because what you convey outwardly is the ‘veil of professionalism’ that is lowered in front of the patient, not to show how much you can or cannot empathize with the patient.” (Student 24)

Changes over the span of the course. The second seminar session (T2) was used to discuss the personal development and the changes in students’ reception of the course over time. They state that the discomfort had vanished. The team worked well together, and teamwork was described as a major factor of effective work.

“What really contributed to that I can imagine myself working as a doctor, was the collaboration [at the table].” (Student 23)

The biggest issue was “normality,” and how regularly viewing a cadaver impacts their perception of dissection:

“It [the dissection] has become the most natural thing, but yesterday I had a moment again. The head was lying at the bottom, next to a leg, there was the heart, there the lung, […] And I thought, ‘We have made quite a mess here.’ […] This was just a statement, where I thought we should think about what we are doing here.” (Student 26)

“[…] When in the beginning I had to force myself to say, ‘This is normal and good, what we are doing,’ now it is the other way around, I now have to force myself to ask myself what we are doing after all. When I look over and see they have detached a head, then I have to realize, ‘They just detached a head!’ That all happens with a normality that I did not want to accept […].” (Student 21)

Leading up from the discussion on normality, students also drew a distinction between inurement and habituation as part of their professional identity formation. They disputed the emotional and rational parts of mental processing of the dissection experience, and how this translates to the doctor–patient relationship. Students discussed inurement as habituation with a negative emotional connotation that was nevertheless explainable:

“Habituation is, if something is normal for you, but you are aware of […] what you do, and that you’re cutting open a human. And in inurement, I don’t care if it is a human or a pig, in the end.” (Student 26)

“It is a question of perspective. If you have the feeling that something gets lost, then you may call it inurement. […] Habituation, inurement, one is emotionally loaded and the other isn’t.” (Student 24)

“I believe that […] what we conceive as inurement [is] a necessary protective function, or […] a level that you have to reach, otherwise it doesn’t make sense that you do that [dissection] for 10 weeks. It is at least the next level for me.” (Student 21)

New topics dealt with reflection on body donation and the upcoming commemoration celebration:

“For me, this [the commemoration service] is the appreciation of the person. I can’t say I have built the deepest emotional bond with the cadaver, but […] this is a process of [re-]humanization for the person, back from being a learning object.” (Student 26)
“I think this [commemoration service] is very, very important for me [...] what I have a lot respect for. On the other hand, I think it’s important to make a bow before one’s body donor. An abstract bow, that is.” (Student 21)

Although the students first stated that they had not noticed any changes, they did describe that they had become more professional over the course of the seminar, and that they thought more about their futures as professional doctors:

“What also contributed a lot to me imagining working as a doctor was the collaboration, and not so much what we did, but how we did it.” (Student 23)

**Written reflections.** The analysis included 96 written reflection texts about professional behavior during the dissection course. From 96 participants, 694 citations were coded, forming 4 main categories with 23 subcategories. The students were divided into four groups to detect differences in the reflection content depending on allied health profession experience and seminar attendance. Except for one category, however, there were unexpectedly no differences detected between these four groups in the categorical trees or reflection topics. Thus, the extracted categories are presented altogether. The following paragraphs summarize the main topics, supported by pertinent quotations from the students’ writing. Participating students are numerically pseudonymized (Participant 01, Participant 02, etc.).

**Expectations.** The students approached the dissection course with curiosity and anticipation. Nonetheless, they feared reaching their own limits, doubted that they could cut into a dead body, and expressed general discomfort:

“At first I was looking forward to and anticipating the course, but I also had doubts: ‘Can I cope with the sight and the work on a cadaver?’” (Participant 1)

They had high expectations regarding the learning outcome, the three-dimensional understanding, and the application of knowledge that they had previously learned:

“My expectations were high, because the course was promoted as the best and most intensive of the whole curriculum. My expectations were that the knowledge of the first term would be consolidated, because it becomes palpable and you can take a closer look at the structures.” (Participant 2)

There were no qualitative differences in the reflection texts of students with or without prior experience in allied health professions, or seminar attendance.

**Experiences.** In the reflection tasks, the special situation in the dissection room and the individual's development over the course were emphasized. Students wrote that they were impeded by the integrity of the skin and the smell:

“The moment where the cloth was lifted was somehow disturbing. I thought, ‘You should not see a human being that way.’ Also, the detachment of the skin was awkward; [there was] silence among all attendees and [the] highest concentration.” (Participant 3)

Supportive elements included the depersonalization, but also the almost compassionate relation to the body donor:

“What really astonished me, that as soon as the skin was removed, the identification of the body donor as a real human decreased severely.” (Participant 13)

“Especially working at the hands and the face was a very personal and touching issue. Through giving our cadaver a name, we really established an emotional bond and handled her very carefully.” (Participant 14)

Of much importance was also the knowledge of the body donors' having made a self-determined decision, the prerequisite courses, respect, and the teamwork and group atmosphere:

“For me, it was most important to know that the body donor made a conscious decision.” (Participant 4)

“The work on the cadaver was shaped by the friendly and team-minded group. The relaxed and respectful atmosphere among us supported working with the body donor.” (Participant 05)

“This collective respect for the body donor [in our group] helped me to work at the cadaver.” (Participant 12)

In addition, the seminar on medical professionalism was mentioned as helpful:

“I regard the seminar on professionalism as very important. We [...] had time beyond the learning to give thought to our behavior in the dissection course [...] and to see how the others feel.” (Participant 6)

Students with previous work experience in allied health professions stated that their experience helped them to cope with the special situation at the dissection table:

“Especially at the beginning of the course, my personal experience helped me to cope with the situation in the dissection room. In my work at the ICU [Intensive Care Unit], I had been in contact with the deceased, death, and dying.” (Participant 7)

**Medical professionalism.** Many students emphasized the contextual importance of the course—anatomical knowledge as the foundation for medical practice. However, other competences were also reflected on: reducing distance from the topic of death and dying, learning teamwork, gaining confidence for working with the living, and learning self-reflection.

“The course inspired me to a reflective and conscious examination of questions like death and body donation and helped me grow personally. I think a ruthless examination of these very topics is essential for the process of becoming a doctor.” (Participant 10)

“In addition, I could experience what responsibility you have to take for your patients later on and how I enjoy working in a team.” (Participant 11)

“During the course I learned how you can work on a human body, without constantly being aware of it. Furthermore, I learned how important respect for a human is for me, even when he is dead.” (Participant 15)

“In my opinion [the course] contributed a lot to my professional behavior, concerning self-reflection, respect and interpersonal skills.” (Participant 16)

Interestingly, many students acknowledged an increased appreciation for the body donor but would not donate their own bodies. There were no differences between the groups for this category.
Changes over the span of the course. Students from all groups described similar adaption to the dissection process. This process comprised losing their reluctance and abandoning their diffidence toward the cadaver:

“I was astonished that we all lost our fear of contact and that we were able to deal with the cadaver more rationally over the [span of the] course.” (Participant 8)

Students gained self-confidence and the feeling of “being a real medical student.” They also critically reflected that they had developed an emotional distance, in which the human aspects of their subject were pushed into the background:

“The thought about the human faded, the focus shifted toward the work and the interest in particular structures. This distance grew over the course—especially when, at the end, only two half-heads were lying around, [then] the specimen had far less of an identity.” (Participant 9)

There were no qualitative differences in the reflection texts of students with or without seminar attendance, or with prior experience in allied health professions.

Aim 2: Compare the Qualitative Content of Both Formats, Oral and Written Reflections

As can be seen from the previous paragraph, essentially the same four categories could be derived from both oral and written reflections: expectations, experiences, medical professionalism, and changes over the span of the course. Generally, the oral reflections seemed to reveal deeper and more personal insights than the written reflections.

Results of group comparison. As outlined in the methods section, the cohort was split into four groups in order to compare the results gained in the present study. There were no qualitative differences in reflection content between the groups, except for one category: students with experience in allied health professions wrote that their experience helped them cope with the dissection experience. Except for this detail, students wrote and spoke about the same topics, although there were of course some differences in phrasing. The quantitative analysis for the different groups shows the following results: students who attended the voluntary seminar on medical professionalism (Groups 1 and 2, oral reflection) wrote significantly more in their written reflection (392 vs. 288 citations, P < 0.05). The largest semi-quantitative differences arose in the subcategories “circumstances alleviating or impeding the situation” (163 vs. 101 citations) and “changes over the span of the course” (65 vs. 31 citations). No quantitative differences were found between the reflections of students with (Groups 1 and 3) or without (Groups 2 and 4) prior education or work experience in allied health professions (358 vs. 322 citations; not significant, P > 0.05).

DISCUSSION

This study presents qualitative and quantitative data on students’ development of a professional identity during a dissection course. With two independent measures—a seminar on professionalism (oral reflection) and a learning portfolio (written reflection)—the study showed that students were contemplating many topics relevant to professional identity formation.

The oral and written reflections generated an elaborate set of themes discussed by the students. As depicted by the students’ quotations from the results, the subcategories under the main categories comprise many traits of professionalism, including empathy, respect, altruism, compassion, teamwork, and self-regulation. The Association of American Medical Colleges (AAMC) and the National Board of Medical Examiners® (NBME®) framework (NBME, 2003) also include respect, altruism, and compassion. McGill University’s framework describes teamwork and self-regulation as core attributes (Steinert et al., 2005), aspects which were also found in the data. The Accreditation Council for Graduate Medical Education (ACGME) Core Competencies (NEJM Knowledge + Team, 2018) lists altruism, empathy, and accountability as professional responsibilities. The German National Competency-based Learning Objective Catalogue (NKLM, 2015) also includes self-reflection, accountability, and integrity in the professional role. Thus, the results of this study can be considered credible and generalizable to existing constructs of professionalism.

The written portfolio reflections contain similar themes but with far less detail. Furthermore, students who attended the seminar wrote significantly more than students who did not. However, a written text of one to two pages may not be contextually equal to a 60-minute seminar discussion. A group discussion is flexible and can produce collaborative results that could not have been otherwise articulated. The social environment may also help students open up and say things they would not have written down when alone (Lutz et al., 2017). The latter may justify expanding the seminars to become a mandatory curricular activity.

There were no qualitative or quantitative differences in written reflections comparing students with prior health care experience and students without such experience. Although it may be argued that additional working experience could provide a superior foundation for reflection, no data in this study supports this hypothesis. Nevertheless, the quantitative data only documented the procedural aspect of reflection, not the contextual focus. Dissection may be such a unique experience, and so novel to any medical student, that no previous impressions from the health care sector seem comparable. In that sense, in terms of experiential learning, all medical students may start on an equal footing.

It is important for medical students to develop professional competencies through continuous experience and reflection during their medical studies (Hilton and Slotnick, 2005). Both the seminar and the learning portfolio present excellent opportunities to foster professional development in the early stages of the curriculum; the key is conjoining these tools with the dissection course (Slotnick and Hilton, 2006). Both interventions described in this article document students’ adaption and development progress over the span of the course, wrestling with the topic of death and dying and reasoning on the projections and implications for their future careers. Furthermore, students can grow from personal struggles and experiences (such as those encountered in the dissection course) by developing resilience strategies (Prayson et al., 2017) that help them to overcome future challenges.

For qualitative research, the concept of demonstrating trustworthiness of the inquiry has been shown to be of importance (Guba, 1981). However, as the concept of trustworthiness has been questioned recently (Morse, 2015), this article refers to rigor, validity, reliability, and generalizability instead,
as strategies exist for these criteria for attaining rigor. Rigor, comprising both validity and reliability, is achieved primarily in the process of data collection and analysis (Morse, 2015). Validity can be attained through prolonged engagement: the seminar discussions were recorded fully, and the conversations unfolded in a secure environment. Trust and intimacy led to thick and rich descriptions, which again added to the validity of the data. For the written reflections, attention was paid to indices of saturation to obtain thick and rich descriptions. The research group held regular peer review debriefings to assist in conceptualizing the data. Reliability is established by accumulating data through replication and duplication, and again with attaining data saturation. Both validity and reliability benefit from triangulation, which is defined as a procedure where researchers search for convergence among multiple and different sources of information to form themes or categories in a study (Creswell and Miller, 2000). Two independent data sets (oral and written reflections) were analyzed and yielded similar results. Generalizability of the data can be attested through comparison with other constructs (see above). Due to the different criteria presented, the study can be considered rigorous.

Teaching Professionalism

Other instruments of teaching undergraduate professionalism have been described; these can be discussed in comparison to the presented program, as far as this is possible. To start with, Spampinato et al. (2014) used a case discussion intervention to teach professionalism during the dissection course. That paper describes only quantitative results, and it would have been interesting to compare the content of the cases and their discussion with the presented data.

Ottenberg et al. (2016) report that academic achievement had no effect on reflective capacity. Due to data privacy/protection, it was not possible to gather data on students’ academic performance in the presented research. In the same manner, an influence neither of sex or age was detected, nor an influence from prior medical experience or education. This matches the findings from the presented data.

Pearson and Hoagland (2010) present an investigation quantifying the change in professionalism during the dissection course. They found no significant loss of professional attitudes in their student cohort in any of the American Board of Internal Medicine domains (ABIM, 1995), which are altruism, accountability, excellence, duty, honor and integrity, and respect for others. Furthermore, their cohort experienced a reordering of professional attitudes toward altruism. The presented study was not designed to measure changes in behavior; however, altruism and the ABIM domains of accountability, respect, honor, and integrity are categories that were also found in the portfolios and the seminar transcripts.

Kotzé and Mole (2013) implemented two questionnaires to induce peer discussions related to students’ perceptions of cadaver dissection. The questionnaire intervention timetable was very similar to the oral reflection seminar schedule (T1 and T2), and the items on their questionnaire share similarities to the conversation guide. However, the questionnaires were analyzed quantitatively, so the results are only slightly comparable to the qualitative data. Notably, results from Kotzé and Mole study also show habituation (significantly less fear comparing T2 to T1) but less emotional detachment from the cadaver as a coping mechanism after 1 month. The authors attributed this to more peer discussions (Kotzé and Mole, 2013). In contrast, the current study shows that the discussions only start the reflection on detachment and depersonalization.

The reflection on detachment transitions well to another important subtopic of the written reflections: students discussing habituation and inurement through dissection as part of professionalism. The students “detach” themselves emotionally from the cadaver to be able to dissect without discomfort. This concept of “detached concern,” first formulated by Lief and Fox (1963), is comparable to the detachment that enables doctors to listen empathetically to their patients without being emotionally involved (Lief and Fox, 1963). Recent data from qualitative studies further suggest that students oscillate between two different views of the cadaver: the specimen as human being and the specimen as a learning object (Tseng and Lin, 2016; Goss et al., 2019). As a dynamic and individual process, the detachment may go so far that students overly react with emotional blunting, inurement, cynicism, or joking around. This expands to the issue of dehumanization through dissection, which also has been addressed by several authors (Hafferty, 1988; Dickinson et al., 1997; Plaisant et al., 2011). In the oral reflections of the present study, students argued that habituation is discernible from inurement through consciousness of what one does and through one’s emotional involvement. They stated that thoughtless practice is “losing something” and shows indifference about what one is doing. Interestingly, although the discussion may have pointed in that direction, the term “dehumanization” was never used in the oral reflections. Students concluded that habituation and even inurement may be reasonable, in order to push boundaries or overcome obstacles (citations not shown) as well as a protective function.

Assessment of Medical Professionalism

A broad variety of instruments assessing professionalism have been published (Bryan et al., 2005; Schubert et al., 2008; Gregory et al., 2009; Camp et al., 2010; Li et al., 2017; Mullikin et al., 2019). However, most of these—like direct observations (e.g., mini clinical examination) or collated views (e.g., multisource feedback)—only apply to a clinical setting (Hodges et al., 2019). Few measures are regularly implemented in preclinical medical education, the most common being a reflective approach (Maudsley and Strivens, 2000b; Sandars, 2009; Mann et al., 2009). Other instruments include situational judgment tests (Schubert et al., 2008), peer and self-evaluation (Bryan et al., 2005; Gregory et al., 2009), individual and group feedback (Camp et al., 2010), and peer nominations (Mullikin et al., 2019). In the curriculum described in the present study, a reflective approach utilizing a portfolio and academic mentors was chosen, as this approach can serve as a measure across 6 years of medical education, whereas other interventions are only intermittent.

Limitations of the Study

There are several limitations to this study. Because the seminar is a voluntary activity, the results from the oral reflections most likely contain a selection bias, as presumably only interested students were reached. This approach may likely exclude those who truly need guided reflection or students who may have an incorrect self-perception. The faculty’s discussion on making
the oral reflections obligatory for all students is ongoing. Such a move would eliminate the selection bias for further investigations, but they could also make the seminars subject to more superficial and socially desirable group discussions.

Another limitation is that the study lacks an external evaluation measure of professional behavior—attainable through, for example, teaching assistants, teaching faculty, or a situational judgment test (Schubert et al., 2008). The study’s results are based only on students’ written self-reflections (portfolio) and reported experiences (seminar). The portfolio is mandatory for every student; however, it may be easy to write a socially desirable reflection. Further studies should aim to verify the reflection content with an external assessment tool, such as a rubric like the one published by Wald et al. (2012).

As the aim of this study was to explore professional identity formation, it relies on qualitative data. However, there have already been attempts to quantify professionalism. For example, the Penn State College of Medicine Professionalism Questionnaire contains factors including accountability, altruism, duty, enrichment, equity, honor and integrity, and respect (Blackall et al., 2007). Future research could aim for validation of the found categories with a quantitative measure, to attain construct validity.

CONCLUSIONS

The classic preclinical dissection course conveys competencies of professionalism. Reflection content from students in this course corresponds with categories from existing competency frameworks. A learning portfolio is suitable for documenting the development of these competencies. An accompanying seminar can increase the depth of the reflection in the portfolio. Prior education or work experience in allied health professions has no impact on the content or quantity of the reflection.

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