BMJ Open

Return-to-Learn: Educator Perspectives on Concussion Management in the College Classroom

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2020-044487
Article Type:	Original research
Date Submitted by the Author:	06-Sep-2020
Complete List of Authors:	Bevilacqua, Zachary ; Rochester Institute of Technology, Exercise Science Cothran, Donetta; Indiana University Bloomington, Kinesiology Rettke, Devin; Indiana University Bloomington, Kinesiology Koceja, David; Indiana University Bloomington, Kinesiology Nelson-Laird, Thomas; Indiana University Bloomington, Kinesiology Kawata, Keisuke; Indiana University Bloomington, Kinesiology
Keywords:	Neuropathology < NEUROLOGY, TRAUMA MANAGEMENT, PUBLIC HEALTH

I, the Submitting Author has the right to grant and does grant on behalf of all authors of the Work (as defined in the below author licence), an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the terms applicable for US Federal Government officers or employees acting as part of their official duties; on a worldwide, perpetual, irrevocable, royalty-free basis to BMJ Publishing Group Ltd ("BMJ") its licensees and where the relevant Journal is co-owned by BMJ to the co-owners of the Journal, to publish the Work in this journal and any other BMJ products and to exploit all rights, as set out in our licence.

The Submitting Author accepts and understands that any supply made under these terms is made by BMJ to the Submitting Author unless you are acting as an employee on behalf of your employer or a postgraduate student of an affiliated institution which is paying any applicable article publishing charge ("APC") for Open Access articles. Where the Submitting Author wishes to make the Work available on an Open Access basis (and intends to pay the relevant APC), the terms of reuse of such Open Access shall be governed by a Creative Commons licence – details of these licences and which Creative Commons licence will apply to this Work are set out in our licence referred to above.

Other than as permitted in any relevant BMJ Author's Self Archiving Policies, I confirm this Work has not been accepted for publication elsewhere, is not being considered for publication elsewhere and does not duplicate material already published. I confirm all authors consent to publication of this Work and authorise the granting of this licence.

Return-to-Learn: Educator Perspectives on Concussion Management in the College Classroom

Word Count: 5171

Zachary W. Bevilacqua, Ph.D., ATC
Department of Exercise Science, Wegmans School of Health and Nutrition
Rochester Institute of Technology, Rochester, New York, USA

*** Corresponding Author:**
Zachary W. Bevilacqua, Ph.D., ATC
(585) 313-4608
zwbihst@rit.edu

Donetta J. Cothran, Ph.D.
Department of Kinesiology, School of Public Health-
Bloomington, Indiana University, Bloomington, Indiana, USA
dcothran@indiana.edu

Devin J. Rettke, MS
Clinical Neurotrauma Laboratory, Department of Kinesiology, School of Public Health-
Bloomington, Indiana University, Bloomington, Indiana, USA
drettke@iu.edu

David M. Koceja, Ph.D.
Department of Kinesiology, School of Public Health-
Bloomington, Indiana University, Bloomington, Indiana, USA
koceja@indiana.edu

Thomas F. Nelson-Laird, Ph.D.
Department of Kinesiology, School of Public Health-
Bloomington, Indiana University, Bloomington, Indiana, USA
tflaird@indiana.edu

Keisuke Kawata, Ph.D., ATC
Clinical Neurotrauma Laboratory, Department of Kinesiology, School of Public Health-
Bloomington, Indiana University, Bloomington, Indiana, USA
kkawata@indiana.edu

Keywords: Return to Learn, RTL, Concussion, College, Educator

RETRURN-TO-LEARN: EDUCATOR PERSPECTIVES ON CONCUSSION MANAGEMENT IN THE COLLEGE CLASSROOM

ABSTRACT

Objectives: To gather the perspectives of collegiate instructors regarding how concussion is managed within the college classroom. To introduce the themes surrounding collegiate Return-to-Learn (RTL) and the classroom management of students with concussion.

Design: Qualitative grounded theory

Setting: Large, public university in the Midwest

Participants: Twenty-three college instructors participated in a private, semi-structured, audio-recorded, one-on-one interview. Participants included 12 males and 11 females. Interview recordings were transcribed verbatim, followed by an iterative process of open- and axial-coding, performed by two researchers.

Results: Three themes emerged from the coded data: 1) Awareness- external knowledge of concussion & previous experiences, 2) Legitimacy- medical note provided & no note provided, and 3) Willingness to help- instructor's role & feasibility of the accommodation. Psychosocial factors such as small class sizes, graduate-level students, and an instructor's empathy appeared to influence an instructor's decision making when accommodating a student recovering from concussion.

Conclusions: These novel data provide foundational evidence regarding how college instructors perceive and subsequently manage concussion within the classroom, while also offering accuracy to aims of subsequent collegiate RTL investigations

Article Summary: RTL is an emerging field within concussion management, yet is grossly underexplored within the college setting. By utilizing a grounded theory approach, this article introduces the themes that dictate the landscape of return-to-learn for a college student.

Strengths and limitations of this study:

- A grounded theory approach was used to discover the themes surrounding this unexplored field of collegiate RTL
- One-on-one interviews allowed participants to express private and individualized perspectives
- Two-coder system maintained the standard of qualitative analysis procedures
- Six trustworthiness measures significantly mitigated author bias
- Data was gathered from a variety of instructors, not just those within a School of Health

INTRODUCTION

In recent years, management of concussion injury in school aged individuals has been centered around re-integrating students back to the athletic field, known to as return-to-play (RTP), as well as the classroom, referred to as return-to-learn (RTL). RTL is a gradual, individualized process that parallels RTP in both its aim, as well as its importance. In fact, literature would indicate that completion of a RTL progression should take priority over a RTP progression,[1] as consensus statement guidelines state that "children and adolescents should not return to sport until they have successfully returned to school".[1] Furthermore, DeMatteo asked the question of "what comes first" between RTL and RTP, and found that while these protocols can successfully be completed in tandem, the final stages of a RTP protocol should be postponed until a RTL progression has been fulfilled.[2] Despite its significant position within the spectrum of concussion management, RTL surprisingly remains overshadowed by RTP studies.

To date, systematic review of RTL data has concluded that factors like age, grade level, and course load must all be considered when returning a student to the classroom.[3] For example, high school students reported a greater quantity and severity of symptoms, in addition to experiencing a delayed RTL, versus younger students.[4-7] Moreover, high school students had significantly more school related problems, diminished academic skills, and increased concerns about the academic repercussions of their injury, versus younger students.[7] Lastly, increases in both cognitive load and school attendance were seen to exacerbate symptomology.[4,8-11] These findings collectively suggest that a relationship exists between higher levels of academia and

increased post-concussion difficulties; yet, the extent of this link is unknown, given that RTL research has produced minimal findings beyond the high school setting.[12-14]

The lack of college-aged RTL data is puzzling, considering that the collegiate environment presents students with several distinct challenges. For instance, because attending college incurs a financial undertaking, students may have to carry part-time employment simultaneous to engaging in highly competitive and rigorous curricula.[15] Students are also tasked, possibly for the first time, with living and interacting with individuals of different ethnicities, socioeconomic backgrounds, countries, and ages; as with adult learners.[16] Lastly, college students are viewed as autonomous learners, which requires them to quickly adopt effective adult-like traits, such as time management. Acknowledging the various challenges that a college student encounters, it is reasonable to suggest that appropriate support within the classroom could alleviate some of the stress that students encounter while on campus. In fact, a significant body of literature would attest to the importance of instructor-student interactions, and its positive effect on outcomes like attitudes towards courses, increased studying, and higher average grades.[17-24] In the event of a concussion, an instructor could continue to exhibit this support, chiefly through the implementation of any classroom accommodations the student may need. Instructors also have the greatest amount of school-related contact time with students, making their perspectives on how students with concussion are supported throughout their recovery, increasingly valuable. Acknowledging that college students experience a unique set of stressors and circumstances, it becomes prudent to explore the characteristics specific to this setting. Furthermore, due to the paucity of college-aged RTL data, investigators should begin

this exploration by utilizing an approach that will uncover the foundational themes within the college setting. In doing so, subsequent research will have a backdrop in which to reference, offering accuracy to future aims. Therefore, by implementing a qualitative grounded theory approach, the current study sought to use the perspectives of collegiate instructors to introduce the themes surrounding collegiate RTL and the classroom management of students with concussion.

METHODS

Participants

Twenty-three college instructors from a large, public institution, were included. Participants were derived from five schools on campus: Public Health, Business, Education, Public & Environmental Affairs, and Optometry. Participants satisfied two inclusion criteria, 1) current non tenure-track (NTT), tenure-track (TT), adjunct (ADJ) faculty with teaching responsibilities, and 2) have previously taught a student with concussion in the college classroom within the past 10 years (not in a physical activity setting). We chose to exclude experience within physical activity based courses considering that they place a demand on cardiorespiratory physiology, which resembles a return-to-play course of management. Eligible participants were identified via Qualtrics survey (Qualtrics Survey Software®), distributed by email. Once identified, participants voluntarily signed an informed consent, demographics were gathered (Table 1.), and the interview was conducted. Permission to conduct interviews was given by the X Institutional Review Board, and given exempt status.

Table 1. Demographics

School	Sex	Age	Ethnicity	Teaching in College (in years)	Rank	Instructed Concussed Students (past 10 years)	Class Sizes	RTL Protocol	Concussion Hx

PH	F	64	White	22	NTT	3	40 - 240	Unsure	Yes
	M	38	White	15	NTT	10	3 - 15	Unsure	No
	F	31	White	10	NTT	7	10 - 45	No	Yes
	F	55	White	20	NTT	5	30 - 40	Unsure	Yes
	F	36	White	6	NTT	2	25 - 125	Unsure	No
	F	54	White	28	NTT	3	15 - 25 - 40 - 150	Yes	Yes
	F	54	White	29	NTT	2	1 - 10 - 100 - 250	Yes	Yes
	M	68	White	27	NTT	1	5 - 20	Unsure	Yes
	M	57	White	8	NTT	2	30 - 60	Yes	Yes
	M	59	White	17	NTT	1	8 - 12 - 38	Unsure	No
	M	55	Latino	25	TT	2	10 - 25 - 70	Unsure	No
	M	62	White	31	TT	5	10 - 150	Unsure	Yes
	F	66	White	40	TT	1	30 - 50	No	No
	F	45	Latino	9	TT	2	10 - 30 - 50	Unsure	No
	F	38	White	15	TT	1	3 - 12 - 85 - 100	Unsure	Yes
BUS	M	39	White	6	NTT	3	30 - 40	Yes	No
	F	55	White	10	NTT	18	24 - 35 - 40 - 80	Unsure	No
	M	74	White	45	NTT	10	24 - 100 - 200	Yes	Yes
	M	56	White	26	NTT	2	15 - 275	Unsure	No
	M	38	White	7	TT	2	20 - 40	Unsure	Yes
ED	F	70	White	40	TT	2	5 - 24	Yes	Yes
OPT	M	52	White	14	TT	2	10 - 80	Yes	Yes
PEA	M	41	White	15	TT	2	8 - 60 - 100	Unsure	Yes

PH – Public Health, BUS - Business, ED - Education, OPT - Optometry, PEA – Public & Environmental Affairs, NTT – Non Tenure-Track, TT – Tenure-Track

Patient and Public Involvement

No patients involved.

Interview

Data collection was performed using a semi-structured, private, audio recorded, one-on-one interview approach. Interviews took an average 62 minutes to complete, were recorded using a voice recorder, and were conducted in a closed-door location of the instructor's choosing. The interview guide (Appendix A) consisted of 8 semi-structured questions, which affords the interviewer latitude to alter question order, to extract

extensive detail from the instructor.[25] All interviews were conducted by a single researcher.

Interactive Materials- Card Sorting Activity 1

Within the interview, instructors were asked to sort 10 index cards, each of which containing the name of an individual or entity on a college campus (Appendix B). Cards were sorted into one of two categories, identifying whether an individual(s) was part of the "RTL team", or "not RTL". Furthermore, instructors were asked to sort these cards twice, first using the criteria *"who do you believe is currently part of a return-to-learn team on campus?"*, and then a second time using the criteria *"if you were in charge of creating a return-to-learn team for campus, who would you include?"*.

Interactive Materials- Card Sorting Activity 2

Instructors perform another card sorting activity, analogous to the one described previously; however, this activity required instructors to rank the feasibility of 16 commonly requested RTL adjustments and accommodations into one of three categories: "very feasible", "somewhat feasible", "not feasible at all". The feasibility ranking referred to an instructor's ability to implement that accommodation in the classes they teach.

Transcription

Each interview was transcribed verbatim, as to capture useful vernacular used by instructors. The online transcribing software service Temi™ was used to transcribe the interviews. The final accuracy of the transcript was carefully reviewed by the same researcher who conducted the interviews.

Data Analysis

Two researchers used inductive reasoning to independently open- and axially-code all transcripts.[26] Collegiate RTL is an unexplored field, and as such requires a grounded theory approach to inductively generate novel themes for future research. Using Microsoft Word®, segments of text were assigned codes, embodying their meaning. Codes of similar nature were grouped together to identify their overarching theme.[26] Two mandatory criteria needed to be satisfied for a theme to be considered overarching and significant: 1) the theme had to include matching codes from at least 80% of the sample, and 2) themes must possess enough heterogeneity between one another. Ensuring heterogeneity between themes confirms that all themes truly represent a robust, yet standalone, characteristic of the research. The cutoff of 80% representation was selected as it indicates significant homogeneity among instructor perspectives, without unnecessarily excluding themes that could not reach unanimous representation. To report the overall perceived feasibility of an accommodation from card sorting activity 2, each category was assigned a numerical value (very feasible = 1, somewhat feasible = 2, not feasible at all = 3). Each time an accommodation was considered “very feasible” by an instructor, it would receive a score of 1; and so on for the remaining two categories. With this, an average feasibility value could be calculated for each individual accommodation. Feasibility values were calculated for the collective sample, as well as NTT and TT cohorts individually.

Trustworthiness Measures

Trustworthiness, or methodological rigor, was maintained through credibility methods[27] (triangulation, member checks, peer debriefing, two-coders) and confirmability

methods[27] (audit trail, journaling). Utilizing several measures ensured that researcher bias was substantially mitigated during all stages of the investigation.

RESULTS

Collectively, 89 codes were consolidated into three overarching themes 1) awareness, 2) legitimacy, and 3) willingness to help. These themes, and their accompanying subthemes, embodied instructor's perspectives regarding concussion in the classroom. Here the crux of each theme will be presented, and supported with instructor quotes.

Awareness

The first theme of awareness refers to an instructor's broad exposure to concussion. This exposure can be dichotomized into a) external knowledge of concussion, and b) internal previous experiences, of which instructors could possess one, or both.

External Knowledge of Concussion. Several instructors derived their understanding of concussion from a variety of sources (news, television, scholarly research, etc.), yet, no one external source appeared to predominate. For example, when asked the question *"when I mention the word concussion, what thoughts come to mind? And what sources are you drawing from?"*, instructors responded:

…"I am up to date more than most, especially because we have concussion research that happens in our own school, in our own department"

…"I know the news side, the CTE's in the NFL players"

…"I'm sure you're familiar with the scene from The Office where Dwight gets a concussion. He ran his car into a fence and gets a concussion, jumps out of his car and throws up, and then immediately gets back in his car and starts driving. And then for the

rest of the day he's a little bit off… he's not himself and his brain doesn't seem to be able to keep itself on track and focus"

Previous Experiences. When asked the same question regarding concussion, some instructors recollected personal experiences as their primary source of understanding concussion. Again, answers differed in detail, however, having personal exposure to concussion (sustained themselves, by a friend/family member, or professional experience working with concussion patients) afforded these instructors to offer greater detail regarding the symptomology and pathology of concussion. Examples of greater detail included:

…"The brain actually smashes against the skull. There's headaches, cognitive challenges, concerns with noises, bright lights. But these are all personal experiences. I also think of potential brain injury, brain swelling"

…"I have a friend who had a midbrain injury with concussion. She went over the handlebars on her bike, had a helmet on, still ended up with a midbrain concussion. She had vertigo, headache, and all kinds of problems that went on for almost two years"

…"I worked inpatient psych on a locked unit with adolescents before I came back to the collegiate environment. [I] Came to understand and appreciate the brain in different ways"

Legitimacy

This second theme of legitimacy represents how instructors internally substantiate a student's claim of having a concussion, and their request for accommodations. Concussion is not always an outwardly recognized injury, and as such, obscures an instructor's already limited ability to identify the presence of a student in need of

accommodation. In turn, this theme focused heavily upon the presence of a medical note, indicating that an injury was present, and that medical care was received. The resulting subthemes were a) medical note provided, or b) no note provided.

Medical Note Provided. Responses revealed several reasons as to why an instructor would rely upon a medical note prior to awarding accommodations to a student. Perhaps the simplest reason is that instructors acknowledge that they should look to the medical professionals for the health status of their students. For example:

…*"the legitimacy comes from the external note, or email. I wouldn't trust my own instincts on something medical, I wouldn't have a clue. So I rely completely on the people who are the professionals"*

…*"it was helpful in that I was given information directly from the medical professional because it helped me provide legitimacy to the claim. I'm sure you can imagine there are often a variety of claims about different types of things, and so it's very helpful when you immediately get the notice"*

…*"If there's some sort of indication [doctor note or university email] that there's a challenge with a student, and they've spoken with us [instructor], and it's legitimate, it's very helpful. It allows me to quickly ignore any kind of, "well when was this?" or "did that actually happen?", type questioning."*

…*"I want a note. I want a note before I excuse an exam, excuse a quiz, excuse a paper"*

Furthermore, while students will inevitably receive their documentation from varying healthcare providers, instructors expressed their preference to receive documentation from a university-affiliated entity (e.g. campus health center, disability student services, etc.).

No Note Provided. If a student was unable to produce medical verification of their injury, instructors were forced to lean on a multitude of factors as they rationalized the decision to either provide, or withhold, accommodations. These factors included a) class size (small vs. large), b) student classification (graduate vs. undergraduate), and c) instructor's empathy. Individually, these factors had a positive or negative implication over an instructor's choice. For example, instructor comments on class size indicate that smaller classes are of benefit:

…"The smaller number makes a little bit more of an intimate setting, and you get to know people as individuals. And more importantly, you get to know personalities"

…"If the question is, do you think class size effected my ability to effectively respond to the concussion situation? It's a yes"

Instructors also voiced an inclination to trust graduate students over undergraduates. For instance:

…"To be very honest with you, and not to sound disparaging towards undergraduates, but I talked to my colleagues who teach undergraduates, and we were all undergraduates at one time. But undergraduates don't come to class sometimes, they're not a serious in their scholarship. So sometimes, I think instructors have to be a little bit more rigid with undergraduates. With a graduate student, they're semi-professionals in a sense, so they trust them"

…"She had offered to bring a doctor's note, but I said that it wasn't necessary. It's a graduate level course, so I go with the fact that they're grad students, and if they're lying, then it's beyond what I care to get into"

Lastly, intrinsic predispositions like empathy appeared to significantly impact an instructor's approach when managing a student with concussion.

…"I tend to be the over-trusting one [instructor]. I rarely find that a student will put something that important [injury] on the table and be lying about it. It's kind of the way I like to approach life. I just think it's a better way to live"

…"I love them. I do, I love my students. They're little people, they're far from home. I think they're stressed with being at this huge university and figuring it all out. And so I don't need to be one of their problems"

The opposing factors described here swayed instructor responses to various degrees. In turn, Figure 1. gives a visual interpretation of how each of these psychosocial variables foreseeably dictated an instructor's decision making.

Willingness to Help

This final theme encompasses an instructor's desire to assist a student recovering from concussion, in addition to the barriers that may impede this process. Heavily inspired by the interview card sorting activities, this theme lends evidence as to an instructor's personal thoughts regarding collegiate RTL. The subthemes include a) instructor's role, and b) feasibility of the accommodation.

Instructor's Role. Card sorting activity 1 asked instructors to determine the members of a collegiate RTL team. Under the first criteria, 70% of instructors believed they were currently part of a RTL team. When asked to explain why they were not part of the team, the remaining 30% reported:

…"I've never been asked to be part of a return-to-learn team for injured students"

Under the second criteria, 95% of instructors believed that they should be part of a collegiate RTL team. Given this high percentage of self-inclusion, the follow-up question was asked, *"what role do you believe you should have on the team?"*. The responses were consistent:

…"Supportive. To help that student do as well as he/she can until they become a rehabilitated student"

…"To help that student become successful in my class despite the diagnosis of concussion"

…"My role is to receive input from other [team] members, and then to discuss with students, what are your goals? Do you want to wait a couple weeks? Do you want to try to fight through this? What are your goals, and how can I help you to achieve those?"

Instructors also consistently excluded three individuals from the RTL team, regardless of sorting criteria: parent, campus police, and coach. Instructors noted:

…"FERPA prevents me from having any conversations with parents"

…"Simply, campus police has nothing to do with Return to Learn…Coaches, they should have no authority over that"

Lastly, when asked to identify the most important member of the team, instructors were equally split between three members: medical provider, disability student services, and the student.

Feasibility of the Accommodation. The results from card sorting activity 2 are shown in Table 2. Across the sample's entirety, instructors perceived "wearing sunglasses" and "excused from exams" as the most and least feasible requests, respectively. When broken into quartiles, the most feasible requests (wear sunglasses

in class, additional time on assignments, additional time on exams) represent academic adjustments, whereas the least feasible requests (decreased workload, excused from assignments, excused from tests) are classified as academic accommodations. Once these trends were identified, instructors were subsequently asked, *"what makes these requests less feasible, and these more feasible?"*. Regarding the least feasible requests, instructors responded:

…"We need to have demonstration of knowledge, which would come from assignments and tests, to be confident that this student is moving along an academic pathway and truly learning"

…"I need to know that they [students] know the material before they leave my class"

Regarding the most feasible requests, instructors responded:

…"I'm going to say this. These [pointing to the less feasible cards] are extra work for me"

…"The question of whether a person cares about a student [to accommodate them] is secondary to, do I, or don't I have time to deal with this"

The introduction of time as a constraint to helping a student was an insightful addition to this subtheme. Upon further probing, we discovered that an instructor's rank may restrict their availability. Several NTT instructors commented on the suspected hardships they believed their TT colleagues would experience. One NTT instructor nicely summarized:

…"At an R one institution, understand what's driving the bus. Research, publications. The teaching is important, but I think the research and the publications are more important. So you know, there are probably some individuals who think, "I'm teaching

this class because I have to, but this [research] is really where I'm going to invest my time", and now I have to deal with a student in my class who has this condition that we don't know how or when it's going to resolve. And I have to deal with that when I'd rather be chasing a grant or writing a scholarly paper. So I could see where dealing with concussions are problematic for some in the academic setting"

A second instructor added:

…"Someone has a hundred things to do, they have time to do 10 of them, and now a student [with concussion] says "hey, can you meet?". And for a lecturer who's all about students and doesn't have this other research, says "sure you can come into my office and take this test that you missed". For a PhD [tenure-track] it's, I don't even know where to fit this in. It's a second priority of a second priority"

Table 2. Accommodation Feasibility Rank Order

Adjustment / Accommodation	Average Value			
	Total Sample	Non Tenure-Track	Tenure-Track	Difference (Non Tenure vs Tenure)
additional time on assignments	1.1	1.2	1.0	0.2
additional time on exams	1.2	1.2	1.2	0.0
audio lectures	1.5	1.6	1.4	0.2
decreased workload	1.7	1.7	1.8	0.1
ear plugs	1.4	1.4	1.3	0.1
excused absence from class	1.2	1.3	1.0	0.3
excused from tests	2.4	2.4	2.3	0.1
excused from assignments	2.0	1.9	2.0	0.1
headphones	1.4	1.3	1.4	0.1
leave class early	1.3	1.4	1.1	0.3
limited computer work	1.5	1.7	1.2	0.5
paper notes	1.2	1.2	1.3	0.1
reducing screen brightness	1.7	1.7	1.7	0.0
rest breaks	1.2	1.3	1.1	0.2
taking tests in a quiet room	1.2	1.2	1.2	0.0
wear sunglasses in class	1.0	1.0	1.0	0.0

Average rank values of adjustments / accommodations reference a 1-3 scale, with a value closer to 1.0 representing a very feasible accommodation, and a value closer to 3.0 representing an accommodation that is not feasible at all.

DISCUSSION

This study is the first to gather an in-depth perspective of how collegiate instructors perceive and manage concussion in their classrooms. While each of the discovered themes independently represent an important aspect of concussion management, they collectively embody the landscape instructors must navigate as they attempt to support their students. Because this study offers the genesis of themes pertinent to collegiate RTL, our discussion will not inspire deductive reasoning or conclusions from the data. Instead, grounded theory allows us to insightfully discuss the implications of our data, and guide the aims of subsequent investigations with a higher degree of accuracy.

Awareness

Previous studies have expressed the importance of educating RTL team members about concussion in an effort to improve patient outcomes;[3,12,28] however, type of concussion awareness did not appear to influence our sample's consistent response to concussion management in the classroom. This contrasts previous research which indicates that knowledge discrepancies exist between academic disciplines. Specifically, business faculty and staff in a collegiate setting have exhibited significantly less knowledge and awareness of concussion versus health science and humanity disciplines.[12] Identifying this contradiction prompted us to question why our sample displayed a homogeneous understanding of concussion. One possible explanation can be offered by Mokris et al.[12], who indicated that awareness of concussion is significantly higher in collegiate faculty that have previously provided accommodations to students with concussion, versus those who have not. Given that our inclusion criteria required

previous experience with concussion in the classroom, we can corroborate Mokris' findings, and begin to understand the origin of our cohort's uniform voice towards concussion.

Despite an instructor's knowledge of concussion, and or its sequela, nearly all expressed a desire to receive medical documentation from students. The exception to this pattern was seen in instructors who expressed an empathetic position towards their student's hardships. In fact, empathy appeared to greatly influence an instructor's decision to award accommodations even in the absence of such documentation (Figure 1.). Human behavior research would indicate that this trend was not simply a coincidence, as both sex and age have been identified as significant predictors of altruistic decision making; with older individuals and females expressing greater altruistic tendencies.[29] More importantly, altruistic decision making is significantly mediated by emotional empathy, instead of reasoning.[29] This supports two of our findings. First, it offers insight as to why instructors still desired medical documentation from students despite their knowledge of concussion or its effect on classroom activities. Second, it helps explain why an empathetic instructor provides students with a greater chance of receiving classroom accommodations when medical verification is absent. Contrary to previous research,[30] these findings collectively require us to question whether targeted concussion education is the most effective method for establishing uniform decision making from instructors. Researchers should also consider the unknown perspectives of instructors who have no exposure to concussion, no experience with it in the classroom, or both. Do these instructors display a different outlook towards concussion and its accommodation in the classroom? Also, if empathy

truly effects instructor decision making, and is not significantly mediated by concussion awareness (e.g. knowledge, previous experience, etc.), then instructors who did not meet our inclusion criteria could theoretically exhibit similar decision making profiles as our sample. Future investigations should be mindful of these possibilities.

Legitimacy

Perhaps the most robust and consistent pattern to arise from this study was an instructor's desire to legitimize a student's request for accommodations. While instructors sought out expert opinion as a confirmation of disability, there were those who also highlighted the need to keep supportive opportunities fair and equally available within the class. Post-concussion accommodations often include privileges like extended time to complete assignments, however, allowing these requests for only one student prompts an instructor to seek a valid reason for doing so. Medical documentation will not only confirm a need for assistance, but will also maintain the status of a fair classroom environment. Interestingly, nearly all instructors expressed a desire to receive medical documentation, however, no one addressed the possible struggles of obtaining such documents.

Requiring a student to receive medical care prior to granting accommodations not only ensures that the health of the student is under proper medical supervision, but it also imposes a financial burden upon them. In fact, this burden may be more tangible than expected, as nationwide survey data indicates that nearly 60% of colleges (150 public from 42 states and 133 private from 32 states) have concerns about under-insured students attending their institutions; as dictated by a student having ≥ $1,000 deductible plan.[31] To complicate matters further, some institutions do not offer health insurance

plans to their students, or do not require students to carry health insurance while enrolled.[32-34] Of greater concern, however, is that some universities have clearly recognized concussion as a covered disability[35-37], while others have remained ambiguous in their scope[38-40]. Impressionably, this conveys the notion that students at select institutions may not receive accommodations for their concussion.

Until concussion injury is ubiquitously legitimized for college students, we must continue to wrestle with the intricate decision making that instructors undergo in the absence of medical documentation. As seen in Figure 1., the logistical and psychosocial characteristics of an instructor and their classroom can dictate the acquisition of concussion assistance. For instance, instructor responses seemed to tether a disadvantaged position to larger classes and undergraduate students (Figure 1.). Pragmatically, a large lecture hall does not afford an instructor the opportunity to gain an interpersonal connection with many of their students, and therefore could hinder an instructor's ability to view requests from those students as impartial or truthful. This was supported by the opinion that undergraduate students are *"not as serious in their scholarship"*. In contrast, teacher-student interactions within smaller classes were portrayed as *"intimate"* and *"personable"*, allowing instructors to learn about their students as individuals. Divergence between how instructors referenced large and small classes lends us valuable insight as to how concussion symptomology may be interpreted in each of these settings. To explain, concussion injuries are often accompanied by psychological symptom profiles (irritability, anxiety, sadness, etc.) which are not always outwardly recognizable. In turn, having a pre-injury "baseline" of a student's behavior and tendencies within the classroom could not only alert an instructor

as to any deviations from the student's norm, but also be used as evidence to support a student's undocumented claim of having a concussion. In addition to smaller classes, instructors also suggested that trust was implicitly given to graduate level students, given their assumed professional status. While this benefits students pursuing post-graduate studies, these students are typically not the majority enrolled at an institution, therefore leaving the larger student population in jeopardy. The overall uncertainty of how an instructor will internally rationalize a student's request for help is a predicament we refer to as "teacher roulette", which was hinted at by one instructor:

…"You're [the student] kind of at their [the instructor] mercy. It's like, "oh, I got one that's accommodating….I hold the keys to all the gates, and the students know it"

Classroom elements like size or graduate students pose an interesting, and perhaps biased, line of thought from instructors. Future investigations should cautiously explore and add clarity to these initial patterns. Moreover, the experiences of previously concussed undergraduate and graduate students should be gathered to see if their first-hand experiences substantiate the potential inequities identified here.

Willingness to Help

An instructor's desire to help a student with concussion is seemingly corralled by what they believe their role to be, in addition to the feasibility of what is being requested of them. Consistently, our instructors believed that their role within a RTL team should be peripheral and responsive. This triangulates their desire to receive confirmation of injury from medical personnel. Additionally, no instructor identified themselves as the most important member of the RTL team, reaffirming their position as a peripheral contributor. It should be noted, however, that the external stance of an instructor is not indicative of

lessened importance. Instead, it is perhaps drawing attention to the view that concussion is first and foremost a medical issue, and while academic faculty and staff play a pivotal role in the seamless re-integration of academic tasks, the course of treatment should be directly supervised and adjusted by medically trained personnel. The rank order (Table 2.) of academic supports stratified which requests may face pushback by an instructor. Triangulation of this data to instructor responses allowed us to detect a temporal undertone associated with an accommodation's feasibility. Therefore, we hypothesize that instructor's views of feasibility stem from a balance between the work required to implement an academic support, and the time needed to do so. To explain, the academic supports that were scored as very feasible (wear sunglasses in class, additional time on assignments, additional time on exams) all possess a "hands off" quality, requiring no additional demand on the instructor. In contrast, somewhat feasible accommodations (audio lectures, limited computer work) may require instructors to create alternative assignments or separate audio recordings of their lectures. Therefore, it can be speculated that the implementation of an adjustment or accommodation by an instructor is inversely correlated to its time commitment. This correlation, however, does not appear to be the chief influence for the scoring of our least feasible accommodations (decreased workload, excused from assignments, excused from tests). Instead, instructor responses suggest that maintaining course integrity is the driving factor. Curriculums, particularly those within accredited programs, set forth a course of instruction designed to ensure that students have acquired a specific level of skill and knowledge prior to degree maturation. In turn, instructors likely feel responsible to safeguard the standards of their respective

departments by upholding the integrity and rigor of their individual courses. Additionally, courses within a curriculum are routinely arranged in a manner that requires a student to display pre-requisite knowledge prior to advancing to the subsequent course. Therefore, a student forgoing an entire exam/assignment would contradict this principle. It should be noted, that while excusing exams/assignment were labeled as unacceptable, all instructors reported that they would be willing to postpone these items until the student had recovered.

FUTURE DIRECTIONS

While the present study warrants replication, there are several factors that future investigations should also consider. First, this study was conducted at a large, public institution; therefore, faculty at other colleges and universities (e.g. smaller, private, etc.) may possess idiosyncratic perspectives unique to their setting. Additionally, data indicates that nearly 50% of the faculty positions at degree granting institutions are adjunct or part-time,[41] necessitating their opinions be gathered as well. Lastly, because certain health disparities are the result of race and ethnicity, it is possible that an instructor's perspective towards injury and illness is influenced by their background. Because the studied university is comprised of only 20% minority faculty,[42] ethnic and racial heterogeneity must be a chief component of follow-up inquiry.

As expected, our themes inductively inspired several questions that will broaden our understanding of collegiate RTL. Specifically, the effect of concussion on college student academic performance, the influence of educational efforts on instructor decision making, the efficacy of various medical notes, and the perspectives of other

groups (e.g. instructors with no classroom experience with concussion, college students with history of attending class while recovering from concussion).

CONCLUSION

Our findings are the first to outline RTL management in the collegiate setting. Of primary importance, the themes generated here not only illustrate the foundational characteristics of collegiate RTL, but also provide a platform for future collegiate RTL research. We would like to note that these themes, while guided by several trustworthiness measures, are not indicative of a widely transferable set of evidence. Instead, our themes are meant to represent a credible, transparent, and robust depiction of our cohort's voice regarding the management of concussion within the classroom.

Acknowledgements: The authors acknowledge the support of the 23 instructors who voluntarily participated in this research.

Author Contributions: ZWB designed the research idea. DJC, DMK, TFL, and KK refined the study protocol and study implementation. DJR acted as the second coder of the data. All the authors contributed to the writing and editing of the manuscript.

Funding statement: This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests: The authors have no competing interests to disclose.

Ethics approval: Ethics approval to conduct this research was received from X University Institutional Review Board, and given exempt status.

Data statement: Technical appendix, statistical code, and dataset available from the Dryad repository, DOI: [include DOI for dataset here].

REFERENCES

1. McCrory P, Meeuwisse W, Dvorak J, et al. Consensus statement on concussion in sport-the 5(th) international conference on concussion in sport held in Berlin, October 2016. *Br J Sports Med.* 2017;51(11):838-847.
2. DeMatteo CA, Randall S, Lin CA, Claridge EA. What Comes First: Return to School or Return to Activity for Youth After Concussion? Maybe We Don't Have to Choose. *Front Neurol.* 2019;10:792.
3. Purcell LK, Davis GA, Gioia GA. What factors must be considered in 'return to school' following concussion and what strategies or accommodations should be followed? A systematic review. *Br J Sports Med.* 2019;53(4):250.
4. Corwin DJ, Wiebe DJ, Zonfrillo MR, et al. Vestibular Deficits following Youth Concussion. *J Pediatr.* 2015;166(5):1221-1225.
5. Purcell L, Harvey J, Seabrook JA. Patterns of Recovery Following Sport-Related Concussion in Children and Adolescents. *Clin Pediatr (Phila).* 2016;55(5):452-458.
6. Ransom DM, Burns AR, Youngstrom EA, Vaughan CG, Sady MD, Gioia GA. Applying an Evidence-Based Assessment Model to Identify Students at Risk for Perceived Academic Problems following Concussion. *J Int Neuropsychol Soc.* 2016;22(10):1038-1049.
7. Ransom DM, Vaughan CG, Pratson L, Sady MD, McGill CA, Gioia GA. Academic effects of concussion in children and adolescents. *Pediatrics.* 2015;135(6):1043-1050.

8. Brown NJ, Mannix RC, O'Brien MJ, Gostine D, Collins MW, Meehan WP, 3rd. Effect of cognitive activity level on duration of post-concussion symptoms. *Pediatrics.* 2014;133(2):e299-304.

9. Darling SR, Leddy JJ, Baker JG, et al. Evaluation of the Zurich Guidelines and exercise testing for return to play in adolescents following concussion. *Clin J Sport Med.* 2014;24(2):128-133.

10. Makki AY, Leddy J, Hinds A, et al. School Attendance and Symptoms in Adolescents After Sport-Related Concussion. *Glob Pediatr Health.* 2016;3:2333794x16630493.

11. Lovell MR, Collins MW, Iverson GL, et al. Recovery from mild concussion in high school athletes. *J Neurosurg.* 2003;98(2):296-301.

12. Mokris R, Kessler, A, Williams, K, Ranney, J, Webster, J, Stauffer, K. Assessing concussion knowledge and awareness in faculty and staff in a collegiate setting. *Journal of Concussion.* 2019;Volume 3: 1–11.

13. Bevilacqua ZW, Kerby ME, Fletcher D, et al. Preliminary evidence-based recommendations for return to learn: a novel pilot study tracking concussed college students. *Concussion.* 2019;4(2):Cnc63.

14. Runyon LM, Welch Bacon CE, Neil ER, Eberman LE. Understanding the Athletic Trainer's Role in the Return-to-Learn Process at National Collegiate Athletic Association Division II and III Institutions. *J Athl Train.* 2020.

15. Statistics NCfE. Nontraditional Undergraduates. In: Education USDo, ed2013.

16. Arnett JJ. Emerging adulthood. A theory of development from the late teens through the twenties. *Am Psychol.* 2000;55(5):469-480.

17. Black AE, Deci EL. The effects of instructors' autonomy support and students' autonomous motivation on learning organic chemistry: A self-determination theory perspective. *Science Education.* 2000;84(6):740-756.

18. Richmond AS, Berglund MB, Epelbaum VB, Klein EM. a + (b1) Professor–Student Rapport + (b2) Humor + (b3) Student Engagement = (Ŷ) Student Ratings of Instructors. *Teaching of Psychology.* 2015;42(2):119-125.

19. Rogers DT. Further Validation of the Learning Alliance Inventory:The Roles of Working Alliance, Rapport, and Immediacy in Student Learning. *Teaching of Psychology.* 2015;42(1):19-25.

20. Ryan RG, Wilson JH, Pugh JL. Psychometric Characteristics of the Professor–Student Rapport Scale. *Teaching of Psychology.* 2011;38(3):135-141.

21. Sheldon KM, Krieger LS. Understanding the Negative Effects of Legal Education on Law Students: A Longitudinal Test of Self-Determination Theory. *Personality and Social Psychology Bulletin.* 2007;33(6):883-897.

22. Wilson JH, Ryan RG. Professor–Student Rapport Scale:Six Items Predict Student Outcomes. *Teaching of Psychology.* 2013;40(2):130-133.

23. Benson T, Cohen, AL, Buskist, W Rapport: Its relation to student attitudes and behaviors toward teachers and classes *TEACHING OF PSYCHOLOGY* 2005;32 (4):237-239

24. Demir M, Burton S, Dunbar N. Professor–Student Rapport and Perceived Autonomy Support as Predictors of Course and Student Outcomes. *Teaching of Psychology.* 2019;46(1):22-33.

25. Tisdell Ma. *Qualitative research : a guide to design and implementation.* Wiley; 2016.

26. Strauss Ca. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory.* 2nd ed: Sage Publications; 1998.

27. Lincoln YG, E. *Naturalistic Inquiry* Sage Publications; 1985.

28. Sarmiento K, Donnell Z, Bell E, Hoffman R. From the CDC: A qualitative study of middle and high school professionals' experiences and views on concussion: Identifying opportunities to support the return to school process. *J Safety Res.* 2019;68:223-229.

29. Rosen JB, Brand M, Kalbe E. Empathy Mediates the Effects of Age and Sex on Altruistic Moral Decision Making. *Front Behav Neurosci.* 2016;10:67.

30. Finn C. Effects of a faculty training program on knowledge and awareness of student concussion and academic performance. *J Am Coll Health.* 2020:1-8.

31. Association ACH. *Student Health Insurance/Benefit Plans: Adapting to the Environment Post Affordable Care.* 2014.

32. Alabama Uo. Insurance Information. Student Health Center and Pharmacy https://shc.sa.ua.edu/billing/insurance-information/. Accessed 7/21/2020.

33. Michigan Uo. Health Services and Insurance Educational and Support Services. https://www.law.umich.edu/currentstudents/studentservices/handbook/edusupsvcs/Pages/UniversityHealthServices.aspx. Accessed 7/21/20.

34. University TAM. Health Insurance. Student Health Services. https://shs.tamu.edu/insurance/. Accessed 7/21/20.

35. Oregon Uo. What is Disability? Accessible Education Center. https://aec.uoregon.edu/content/what-disability. Accessed 7/21/20.

36. Vermont Uo. Documentation Guidelines Center for Academic Success. https://www.uvm.edu/academicsuccess/documentation-guidelines. Accessed 7/21/20.

37. Michigan Uo. Acquired/Traumatic Brain Injury. Services for Students with Disabilities. https://ssd.umich.edu/article/acquiredtraumatic-brain-injury-abitbi. Accessed 7/21/20.

38. College V. Disability Accommodations and Support Services Policy. Accessibility and Educational Opportunity. https://accessibilityandeducationalopportunity.vassar.edu/Students/disability-guidelines/. Accessed 7/21/20.

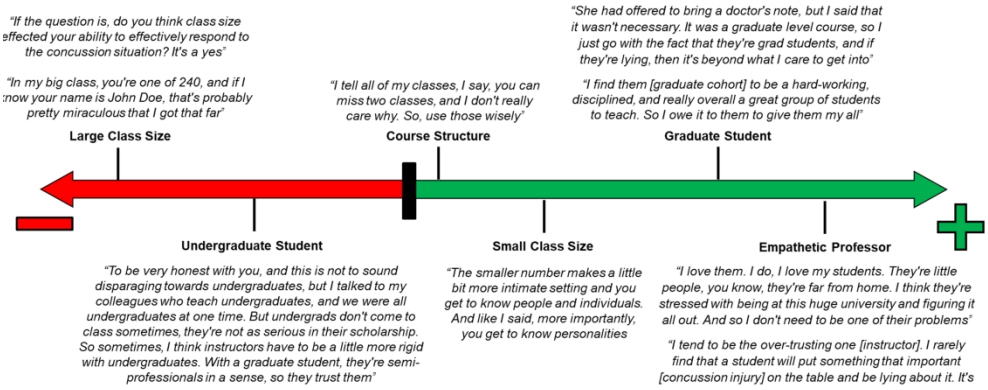
39. Georgia Uo. Temporary Impairments Disability Resource Center. https://drc.uga.edu/site/content_page/temporary-impairments. Accessed 7/21/20.

40. University FS. Documentation Guidelines. Department of Student Support and Transitions. https://dsst.fsu.edu/oas/students/applying-for-services/documentation-guidelines. Accessed 7/21/20.

41. Statistics NCfE. Number of instructional faculty in degree-granting institutions, by employment status, sex, control, and level of institution: Selected years, fall 1970 through fall 2011. In.

42. Bloomington IU. *Full-time Faculty and Staff Headcount by Race and Ethnicity.* 2019.

Figure 1. No Note Provided: Factors Influencing an Instructor's Decision to Allow Accommodations



2534x1131mm (96 x 96 DPI)

APPENDIX A

Opening questions

1. Tell me how long you've been working at your current institution, and what you teach?

2. Where have you heard the term concussion before?
    a. From those sources, what exactly did you learn about concussion?

Investigative Questions

3. You reported that you've had at least one concussed student in your class. Can you tell me more about that experience?

    a. Your experience sounded ____. Would you say educators need something more in order to better help concussed students? Or do you think the current process is working well?
        i. IF guidelines are mentioned, or MD directions are mentioned, then ask this probe
            1. Do you think it is within a teacher's expertise to be making decisions of academic participation for a concussed student?
        ii. Did you know what their needs were?
        iii. Did you feel prepared to handle that student's needs?
            1. Yes: what would you say prepared you?
            2. No: what type of preparation would you say is missing

4. Here are some cards with different academic adjustments and accommodations written on them. I'd like you to place each of these cards in one of the three piles here based on how feasible you believe these are to implement in your school and classroom. (Piles: not feasible at all, somewhat feasible, absolutely feasible)

    a. Overall, what accommodation/adjustment are teachers in your discipline most likely to implement? Least likely to implement?

5. Currently, 9 states observe legislation which mandates high schools to have protocols for gradually returning students with concussion back into the classroom setting. Do you think this type of policy-making should make its way into the collegiate setting?

    a. So you believe these policies should be in collegiate education. What would you say is the first step in making something like this happen?
    b. So you believe college educators should not be responsible for this. What thoughts comprise that statement?

6. Here is an example of an medical note (appendix G) for a concussed student that a teacher might receive. Please take your time to read over it, and tell me what aspects of this note you like, don't like, find helpful, and then we'll discuss your impressions?

    a. What do you find helpful about this note?
    b. What would you say is missing that you would like to receive from a note
    c. Here is another note that an educator might receive (appendix Hf). Do you find this version more/less helpful, and why?
    d. Has a medical professional ever directly reached out to you about a student's concussion?
        i. Who have you spoken with? What was said?

7. Return to learn is a phrase that describes the process of re-integrating a student with concussion back into the classroom after a head injury. Here are some cards with different individuals written on them. I'd like you to place all the individuals you believe to currently be part of the RTL team in this pile labeled "RTL Team", and those who aren't in this pile labeled "Non-member"

    a. I see that you placed "the student's teacher" in the "RTL Team" pile. why is that? What role do you feel you as a teacher have?
    OR
    b. I see that you *did not* place "the student's teacher" in the "RTL Team" pile, why is that? Why do you feel teachers are excluded?
        i. Either case = do you think teachers should play a more central role on the team? Why?
    c. This is who you currently believe to be part of the RTL team. I'd like you to now arrange these individuals based on who you believe should be part of the team, and who shouldn't

8. Are there any key points we haven't talked about that you fell are important for teachers, medical providers, and for me to know?

APPENDIX A *(amended 2/9/20)*

** *highlight indicates change, strikeout indicates removal*

Opening questions

1. Tell me how long you've been working at your current institution, and what you teach?

2. When I say the term concussion, what comes to mind?
    a. From those sources, what exactly did you learn about concussion?

Investigative Questions

3. You reported that you've had at least one concussed student in your class. Can you tell me more about that experience? How did you hear? Who did you communicate with? Etc.

    a. ~~Your experience sounded ____. Would you say educators need something more in order to better help concussed students? Or do you think the current process is working well?~~
        i. ~~IF guidelines are mentioned, or MD directions are mentioned, then ask this probe~~
            1. ~~Do you think it is within a teacher's expertise to be making decisions of academic participation for a concussed student?~~
        ii. ~~Did you know what their needs were?~~
        iii. ~~Did you feel prepared to handle that student's needs?~~
            1. ~~Yes: what would you say prepared you?~~
            2. ~~No: what type of preparation would you say is missing~~

4. Here are some cards with different academic adjustments and accommodations written on them. I'd like you to place each of these cards in one of the three piles here based on how feasible you believe these are to implement in your school and classroom. (Piles: not feasible at all, somewhat feasible, very feasible)

    a. ~~Overall, what accommodation/adjustment are teachers in your discipline most likely to implement? Least likely to implement?~~
    b. Would you change any of your answers if the class size were big? Small?

5. ~~Currently, 9 states observe legislation which mandates high schools to have protocols for gradually returning students with concussion back into the classroom setting. Do you think this type of policy-making should make its way into the collegiate setting?~~

    a. ~~So you believe these policies should be in collegiate education. What would you say is the first step in making something like this happen?~~
    b. ~~So you believe college educators should not be responsible for this. What thoughts comprise that statement?~~

6. Here is an example of an medical note (appendix G) for a concussed student that a teacher might receive. Please take your time to read over it, and tell me what aspects of this note you like, don't like, find helpful, and then we'll discuss your impressions?

    a. What do you find helpful about this note?
    b. What would you say is missing that you would like to receive from a note
    c. Here is another note that an educator might receive (appendix H). Do you find this version more/less helpful, and why?
    d. ~~Has a medical professional ever directly reached out to you about a student's concussion?~~
        i. ~~Who have you spoken with? What was said?~~

    Because this note is from DSS, does that hold any significance to you?

7. Return to learn is a phrase that describes the process of re-integrating a student with concussion back into the classroom after a head injury. Here are some cards with different individuals written on them. I'd like you to first place all the individuals you believe to currently be part of the RTL team in this pile labeled "RTL Team", and those who aren't in this pile labeled "Not RTL". Then I'd like you to arrange these individuals based on who you believe should be part of the team, and who shouldn't.

    e. I see that you did/did not place "teacher/professor" in the "RTL Team" pile. why is that? What role do you feel you as a teacher have?

~~*OR*~~

    f. ~~I see that you *did not* place "the student's teacher" in the "RTL Team" pile, why is that? Why do you feel teachers are excluded?~~
        i. ~~Either case = do you think teachers should play a more central role on the team? Why?~~
    g. ~~This is who you currently believe to be part of the RTL team. I'd like you to now arrange these individuals based on who you believe should be part of the team, and who shouldn't~~
    h. Who is the most important person on the team, or point person?

8. Why do you feel as though you're as accommodating as you are? Is it because you've received a medical note? Is it who the note comes from? Is it something you believe you should do? Is it something you believe is required of you?

9. Are there any key points we haven't talked about that you fell are important for teachers, medical providers, and for me to know?

APPENDIX B

* Each row will be its own separate index card, and will be given to the participant collectively to sort

Medical Doctor / Diagnosing Medical Provider

Athletic Trainer

Student's Coach

Counseling and Psychological Services

Student's Academic Advisor

Campus Disability Services

Professor

Campus Police

Parent/Guardian

Student

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

No	Item	Guide questions/description
	Domain 1: Research team and reflexivity	
	Personal Characteristics	
1.	Interviewer/facilitator	ZWB conducted the interviews
2.	Credentials	Ph.D., ATC
3.	Occupation	University Educator
4.	Gender	Male
5.	Experience and training	Researcher was trained in college pedagogy, qualitative methods and analysis, and has an expertise in clinical neurotrauma
	Relationship with participants	
6.	Relationship established	No
7.	Participant knowledge of the interviewer	Participants only knew that this research was being conducted to gather their perspectives on concussion management in the classroom.
8.	Interviewer characteristics	No bias was reported about either coder, nor the interviewer
	Domain 2: study design	
	Theoretical framework	
9.	Methodological orientation and Theory	Grounded theory
	Participant selection	
10.	Sampling	Purposive
11.	Method of approach	Email
12.	Sample size	23
13.	Non-participation	84 people either did not meet inclusion criteria, or declined
	Setting	
14.	Setting of data collection	University campus
15.	Presence of non-participants	No
16.	Description of sample	12 males (11 White, 1 Latino) and 11 females (10 White, 1 Latino), 14 non-tenure track and 9 tenure-track educators
	Data collection	
17.	Interview guide	Created by the authors
18.	Repeat interviews	No
19.	Audio/visual recording	Yes, audio recordings
20.	Field notes	Interviewer took notes during the interview as appropriate
21.	Duration	Average 62 minutes
22.	Data saturation	Yes, data saturation was reached
23.	Transcripts returned	Yes
	Domain 3: analysis and findings	
	Data analysis	
24.	Number of data coders	2
25.	Description of the coding tree	No
26.	Derivation of themes	Derived from the data
27.	Software	Microsoft Word
28.	Participant checking	No
	Reporting	
29.	Quotations presented	Yes, but were not identified
30.	Data and findings consistent	Yes
31.	Clarity of major themes	Yes
32.	Clarity of minor themes	Yes

BMJ Open

Educator Perspectives on Concussion Management in the College Classroom: a Grounded Theory Introduction to Collegiate Return-to-Learn

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2020-044487.R1
Article Type:	Original research
Date Submitted by the Author:	06-Jan-2021
Complete List of Authors:	Bevilacqua, Zachary ; Rochester Institute of Technology, Exercise Science Cothran, Donetta; Indiana University Bloomington, Kinesiology Rettke, Devin; Indiana University Bloomington, Kinesiology Koceja, David; Indiana University Bloomington, Kinesiology Nelson-Laird, Thomas; Indiana University Bloomington, Kinesiology Kawata, Keisuke; Indiana University Bloomington, Kinesiology
Primary Subject Heading:	Rehabilitation medicine
Secondary Subject Heading:	Health policy, Neurology, Patient-centred medicine, Qualitative research
Keywords:	Neuropathology < NEUROLOGY, TRAUMA MANAGEMENT, PUBLIC HEALTH

I, the Submitting Author has the right to grant and does grant on behalf of all authors of the Work (as defined in the below author licence), an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the terms applicable for US Federal Government officers or employees acting as part of their official duties; on a worldwide, perpetual, irrevocable, royalty-free basis to BMJ Publishing Group Ltd ("BMJ") its licensees and where the relevant Journal is co-owned by BMJ to the co-owners of the Journal, to publish the Work in this journal and any other BMJ products and to exploit all rights, as set out in our licence.

The Submitting Author accepts and understands that any supply made under these terms is made by BMJ to the Submitting Author unless you are acting as an employee on behalf of your employer or a postgraduate student of an affiliated institution which is paying any applicable article publishing charge ("APC") for Open Access articles. Where the Submitting Author wishes to make the Work available on an Open Access basis (and intends to pay the relevant APC), the terms of reuse of such Open Access shall be governed by a Creative Commons licence – details of these licences and which Creative Commons licence will apply to this Work are set out in our licence referred to above.

Other than as permitted in any relevant BMJ Author's Self Archiving Policies, I confirm this Work has not been accepted for publication elsewhere, is not being considered for publication elsewhere and does not duplicate material already published. I confirm all authors consent to publication of this Work and authorise the granting of this licence.

Educator Perspectives on Concussion Management in the College Classroom: a Grounded Theory Introduction to Collegiate Return-to-Learn

Word Count: 5780

Zachary W. Bevilacqua, Ph.D., ATC
Department of Exercise Science, Wegmans School of Health and Nutrition
Rochester Institute of Technology, Rochester, New York, USA

*** Corresponding Author:**
Zachary W. Bevilacqua, Ph.D., ATC
(585) 313-4608
zwbihst@rit.edu

Donetta J. Cothran, Ph.D.
Department of Kinesiology, School of Public Health-
Bloomington, Indiana University, Bloomington, Indiana, USA
dcothran@indiana.edu

Devin J. Rettke, MS
Clinical Neurotrauma Laboratory, Department of Kinesiology, School of Public Health-
Bloomington, Indiana University, Bloomington, Indiana, USA
drettke@iu.edu

David M. Koceja, Ph.D.
Department of Kinesiology, School of Public Health-
Bloomington, Indiana University, Bloomington, Indiana, USA
koceja@indiana.edu

Thomas F. Nelson-Laird, Ph.D.
Department of Kinesiology, School of Public Health-
Bloomington, Indiana University, Bloomington, Indiana, USA
tflaird@indiana.edu

Keisuke Kawata, Ph.D., ATC
Clinical Neurotrauma Laboratory, Department of Kinesiology, School of Public Health-
Bloomington, Indiana University, Bloomington, Indiana, USA
kkawata@indiana.edu

Keywords: Return to Learn, RTL, Concussion, College, Educator

EDUCATOR PERSPECTIVES ON CONCUSSION MANAGEMENT IN THE COLLEGE CLASSROOM: A GOURNDED THEORY INTRODUCTION TO COLLEGIATE RETURN-TO-LEARN

ABSTRACT

Objectives: To gather the perspectives of collegiate instructors regarding how concussion is managed within the college classroom. To introduce the themes surrounding collegiate Return-to-Learn (RTL) and the classroom management of students with concussion.

Design: Qualitative grounded theory

Setting: Large, public university in the Midwest

Participants: Twenty-three college instructors participated in a private, semi-structured, audio-recorded, one-on-one interview. Participants included 12 males and 11 females. Interview recordings were transcribed verbatim, followed by an iterative process of open- and axial-coding, performed by two researchers.

Results: Three themes emerged from the coded data: 1) Awareness- external knowledge of concussion & previous experiences, 2) Legitimacy- medical note provided & no note provided, and 3) Accommodating the Student- instructor's role & feasibility of the accommodation. Psychosocial factors such as small class sizes, graduate-level students, and an instructor's empathy appeared to influence an instructor's decision making when accommodating a student recovering from concussion.

Conclusions: These novel data provide foundational evidence regarding how college instructors perceive and subsequently manage concussion within the classroom, while also offering accuracy to aims of subsequent collegiate RTL investigations

Article Summary: RTL is an emerging field within concussion management, yet is grossly underexplored within the college setting. By utilizing a grounded theory approach, this article introduces the themes that dictate the landscape of return-to-learn for a college student.

Strengths and limitations of this study:

- A grounded theory approach was used to discover the themes surrounding this unexplored field of collegiate RTL
- One-on-one interviews allowed participants to express private and individualized perspectives
- Two-coder system maintained the standard of qualitative analysis procedures
- Six trustworthiness measures significantly mitigated author bias
- Data was gathered from a variety of instructors, not just those within a School of Health

INTRODUCTION

In recent years, management of concussion injury in school aged individuals has been centered around re-integrating students back to the athletic field, known as return-to-play (RTP), as well as the classroom, referred to as return-to-learn (RTL). RTL is a gradual, individualized process that parallels RTP in both its aim, as well as its importance. In fact, literature would indicate that completion of a RTL progression should take priority over a RTP progression,[1] as consensus statement guidelines state that "children and adolescents should not return to sport until they have successfully returned to school".[1] Furthermore, DeMatteo asked the question of "what comes first" between RTL and RTP, and found that while these protocols can successfully be completed in tandem, the final stages of a RTP protocol should be postponed until a RTL progression has been fulfilled.[2] Despite its significant position within the spectrum of concussion management, RTL surprisingly remains overshadowed by RTP studies.

To date, systematic review of RTL data has concluded that factors like age, grade level, and course load must all be considered when returning a student to the classroom.[3] For example, high school students reported a greater quantity and severity of symptoms, in addition to experiencing a delayed RTL, versus both middle and elementary students.[4-7] Moreover, high school students had significantly more school related problems, diminished academic skills, and increased concerns about the academic repercussions of their injury, again versus middle and elementary students.[7] Lastly, inappropriately timed increases in both cognitive load and school attendance were seen to exacerbate symptomology.[4,8-11] These findings collectively suggest that a relationship exists between higher levels of academia and increased post-concussion

difficulties; yet, the extent of this link is unknown, given that RTL research has produced minimal findings beyond the high school setting.[12-14]

The lack of college-aged RTL data is puzzling, considering that the collegiate environment presents students with several distinct challenges. For instance, because attending college incurs a financial undertaking, students may have to carry part-time employment simultaneous to engaging in highly competitive and rigorous curricula.[15] Students are also tasked, possibly for the first time, with living on their own or among unfamiliar persons of different ethnicities, socioeconomic backgrounds, countries, and ages.[16] Lastly, college students are viewed as autonomous learners, which requires them to quickly adopt effective adult-like traits, such as time management. By acknowledging the various challenges that a college student encounters, coupled with the association between pre-morbid anxiety levels and prolonged concussion recovery,[17,18] it is reasonable to suggest that appropriate support within the classroom could alleviate the cumulative stress that students encounter while on campus. In fact, a significant body of literature would attest to the importance of instructor-student interactions, and its positive effect on outcomes like attitudes towards courses, increased studying, and higher average grades.[19-26] In the event of a concussion, an instructor could continue to exhibit this support, chiefly through the implementation of classroom accommodations. Instructors also have the greatest amount of school-related contact time with students, making their perspectives on how students with concussion are supported throughout their recovery, increasingly valuable.

Because college students experience a unique set of stressors and circumstances, it becomes prudent to explore the characteristics specific to this setting. Furthermore, due

to the paucity of college-aged RTL data, investigators should begin this exploration by utilizing an approach that will uncover the foundational themes within the college setting. In doing so, subsequent research will have a backdrop in which to reference, offering accuracy to future aims. Therefore, by implementing a qualitative grounded theory approach, the current study sought to use the perspectives of those close to students, collegiate instructors, to introduce the themes surrounding collegiate RTL and the classroom management of students with concussion.

METHODS

Participants

Twenty-three college instructors from a large, public institution, were included. Participants were derived from five schools on campus: Public Health, Business, Education, Public & Environmental Affairs, and Optometry. Participants satisfied two inclusion criteria, 1) current non tenure-track (NTT), tenure-track (TT), adjunct (ADJ) faculty with teaching responsibilities, and 2) have previously taught a student with concussion in the college classroom within the past 10 years (not in a physical activity setting). We chose to exclude experience within physical activity based courses considering that they place a demand on cardiorespiratory physiology, which resembles a return-to-play course of management. Eligible participants were identified via Qualtrics survey (Qualtrics Survey Software®), distributed by email. Once identified, participants voluntarily signed an informed consent, demographics were gathered (Table 1.), and the interview was conducted. Permission to conduct interviews was given by the X Institutional Review Board, and given exempt status.

Table 1. Demographics

School	Sex	Age	Ethnicity	Teaching in College (in years)	Rank	Instructed Concussed Students (past 10 years)	Class Sizes	RTL Protocol	Previous Experience w/ Concussion
PH	F	64	White	22	NTT	3	40 - 240	Unsure	Yes
	M	38	White	15	NTT	10	3 - 15	Unsure	No
	F	31	White	10	NTT	7	10 - 45	No	Yes
	F	55	White	20	NTT	5	30 - 40	Unsure	Yes
	F	36	White	6	NTT	2	25 - 125	Unsure	No
	F	54	White	28	NTT	3	15 - 25 - 40 - 150	Yes	Yes
	F	54	White	29	NTT	2	1 - 10 - 100 - 250	Yes	Yes
	M	68	White	27	NTT	1	5 - 20	Unsure	Yes
	M	57	White	8	NTT	2	30 - 60	Yes	Yes
	M	59	White	17	NTT	1	8 - 12 - 38	Unsure	No
	M	55	Latino	25	TT	2	10 - 25 - 70	Unsure	No
	M	62	White	31	TT	5	10 - 150	Unsure	Yes
	F	66	White	40	TT	1	30 - 50	No	No
	F	45	Latino	9	TT	2	10 - 30 - 50	Unsure	No
	F	38	White	15	TT	1	3 - 12 - 85 - 100	Unsure	Yes
BUS	M	39	White	6	NTT	3	30 - 40	Yes	No
	F	55	White	10	NTT	18	24 - 35 - 40 - 80	Unsure	No
	M	74	White	45	NTT	10	24 - 100 - 200	Yes	Yes
	M	56	White	26	NTT	2	15 - 275	Unsure	No
	M	38	White	7	TT	2	20 - 40	Unsure	Yes
ED	F	70	White	40	TT	2	5 - 24	Yes	Yes
OPT	M	52	White	14	TT	2	10 - 80	Yes	Yes
PEA	M	41	White	15	TT	2	8 - 60 - 100	Unsure	Yes

PH – Public Health, BUS - Business, ED - Education, OPT - Optometry, PEA – Public & Environmental Affairs, NTT – Non Tenure-Track, TT – Tenure-Track

Patient and Public Involvement

No patients involved.

Interview

Data collection was performed using a semi-structured, private, audio recorded, one-on-one interview approach. Interviews took an average 62 minutes to complete, were

recorded using a voice recorder, and were conducted in a closed-door location of the instructor's choosing. The interview guide (Appendix A) consisted of 8 semi-structured questions, which affords the interviewer latitude to alter question order, to extract extensive detail from the instructor.[27] All interviews were conducted by a single researcher.

Interactive Materials- Card Sorting Activity 1

Within the interview, instructors were asked to sort 10 index cards, each of which containing the name of an individual or entity on a college campus (Appendix B). Cards were sorted into one of two categories, identifying whether an individual(s) was part of the "RTL team", or "not RTL". Furthermore, instructors were asked to sort these cards twice, first using the criteria *"who do you believe is currently part of a return-to-learn team on campus?"*, and then a second time using the criteria *"if you were in charge of creating a return-to-learn team for campus, who would you include?"*.

Interactive Materials- Card Sorting Activity 2

Instructors performed another card sorting activity, analogous to the one described previously; however, this activity required instructors to rank the feasibility of 16 commonly requested RTL adjustments and accommodations into one of three categories: "very feasible", "somewhat feasible", "not feasible at all". The feasibility ranking referred to an instructor's ability to implement that accommodation in the classes they teach. The chosen accommodations were taken from previous work by the authors.[13]

Transcription

Each interview was transcribed verbatim, as to capture useful vernacular used by instructors. The online transcribing software service Temi™ was used to transcribe the interviews. The final accuracy of the transcript was carefully reviewed by the same researcher who conducted the interviews.

Data Analysis

Two researchers used inductive reasoning to independently open- and axially-code all transcripts.[28] Collegiate RTL is an unexplored field, and as such requires a grounded theory approach to inductively generate novel themes for future research. Using Microsoft Word®, segments of text were assigned codes, embodying their meaning. Codes of similar nature were grouped together to identify their overarching theme,[28] and final codes were matched and confirmed between both coders, through an iterative discussion process. Two mandatory criteria needed to be satisfied for a theme to be considered overarching and significant: 1) the theme had to include matching codes from at least 80% of the sample, and 2) themes must possess enough heterogeneity between one another. Ensuring heterogeneity between themes confirms that all themes truly represent a robust, yet standalone, characteristic of the research. The cutoff of 80% representation was selected as it indicates significant homogeneity among instructor perspectives, without unnecessarily excluding themes that could not reach unanimous representation. Subthemes were also independently identified by each coder. Following the initial round of subtheme identification, final subthemes were agreed upon by both coders, again through an iterative discussion process. To report the overall perceived feasibility of an accommodation from card sorting activity 2, each category was assigned a numerical value (very feasible = 1, somewhat feasible = 2, not

feasible at all = 3). Each time an accommodation was considered “very feasible” by an instructor, it would receive a score of 1; and so on for the remaining two categories. With this, an average feasibility value could be calculated for each individual accommodation. Feasibility values were calculated for the collective sample, as well as NTT and TT cohorts individually.

Trustworthiness Measures

Trustworthiness, or methodological rigor, was maintained through credibility methods[29] (triangulation, member checks, peer debriefing, two-coders) and confirmability methods[29] (audit trail, journaling). Utilizing several measures ensured that researcher bias was substantially mitigated during all stages of the investigation.

RESULTS

Collectively, 89 codes were consolidated into three overarching themes 1) awareness, 2) legitimacy, and 3) accommodating the student. These themes, and their accompanying subthemes, embodied instructor’s perspectives regarding concussion in the classroom. Here the crux of each theme will be presented, and supported with instructor quotes.

Awareness

The first theme of awareness refers to an instructor’s broad exposure to concussion. This exposure can be dichotomized into a) external knowledge of concussion, and b) internal previous experiences, of which instructors could possess one, or both.

External Knowledge of Concussion. Several instructors derived their understanding of concussion from a variety of sources (news, television, scholarly research, etc.), yet, no one external source appeared to predominate. For example,

when asked the question *"when I mention the word concussion, what thoughts come to mind? And what sources are you drawing from?"*, instructors responded:

…"I am up to date more than most, especially because we have concussion research that happens in our own school, in our own department"

…"I know the news side, the CTE's in the NFL players"

…"I'm sure you're familiar with the scene from The Office where Dwight gets a concussion. He ran his car into a fence and gets a concussion, jumps out of his car and throws up, and then immediately gets back in his car and starts driving. And then for the rest of the day he's a little bit off… he's not himself and his brain doesn't seem to be able to keep itself on track and focus"

Previous Experiences. When asked the same question regarding concussion, some instructors recollected personal experiences as their primary source of understanding concussion. Again, answers differed in detail, however, having a personal history or exposure to concussion (sustained themselves, by a friend/family member, or professional experience working with concussion patients) afforded these instructors to offer greater detail regarding the symptomology and pathology of concussion. Examples of greater detail included:

…"The brain actually smashes against the skull. There's headaches, cognitive challenges, concerns with noises, bright lights. But these are all personal experiences. I also think of potential brain injury, brain swelling"

…"I have a friend who had a midbrain injury with concussion. She went over the handlebars on her bike, had a helmet on, still ended up with a midbrain concussion. She had vertigo, headache, and all kinds of problems that went on for almost two years"

…"I worked inpatient psych on a locked unit with adolescents before I came back to the collegiate environment. [I] Came to understand and appreciate the brain in different ways"

Legitimacy

This second theme of legitimacy represents how instructors internally substantiate a student's claim of having a concussion, and their request for accommodations. Concussion is not always an outwardly recognized injury, and as such, obscures an instructor's already limited ability to identify the presence of a student in need of accommodation. In turn, this theme focused heavily upon the presence of a medical note, indicating that an injury was present, and that medical care was received. The resulting subthemes were a) medical note provided, or b) no note provided.

Medical Note Provided. Responses revealed several reasons as to why an instructor would rely upon a medical note prior to awarding accommodations to a student. Perhaps the simplest reason is that instructors acknowledge that they should look to the medical professionals for the health status of their students. For example:

…"the legitimacy comes from the external note, or email. I wouldn't trust my own instincts on something medical, I wouldn't have a clue. So I rely completely on the people who are the professionals"

…"it was helpful in that I was given information directly from the medical professional because it helped me provide legitimacy to the claim. I'm sure you can imagine there are often a variety of claims about different types of things, and so it's very helpful when you immediately get the notice"

…"If there's some sort of indication [doctor note or university email] that there's a challenge with a student, and they've spoken with us [instructor], and it's legitimate, it's very helpful. It allows me to quickly ignore any kind of, "well when was this?" or "did that actually happen?", type questioning."

…"I want a note. I want a note before I excuse an exam, excuse a quiz, excuse a paper"

Furthermore, while students will inevitably receive their documentation from varying healthcare providers, instructors expressed their preference to receive documentation from a university-affiliated entity (e.g. campus health center, disability student services, etc.).

No Note Provided. If a student was unable to produce medical verification of their injury, instructors were forced to lean on a multitude of factors as they rationalized the decision to either provide, or withhold, accommodations. These factors included a) class size (small vs. large), b) student classification (graduate vs. undergraduate), and c) instructor's empathy. Individually, these factors had a positive or negative implication over an instructor's choice. For example, instructor comments on class size indicate that smaller classes are of benefit:

…"The smaller number makes a little bit more of an intimate setting, and you get to know people as individuals. And more importantly, you get to know personalities"

…"If the question is, do you think class size effected my ability to effectively respond to the concussion situation? It's a yes"

Instructors also voiced an inclination to trust graduate students over undergraduates. For instance:

…"To be very honest with you, and not to sound disparaging towards undergraduates, but I talked to my colleagues who teach undergraduates, and we were all undergraduates at one time. But undergraduates don't come to class sometimes, they're not a serious in their scholarship. So sometimes, I think instructors have to be a little bit more rigid with undergraduates. With a graduate student, they're semi-professionals in a sense, so they trust them"

…"She had offered to bring a doctor's note, but I said that it wasn't necessary. It's a graduate level course, so I go with the fact that they're grad students, and if they're lying, then it's beyond what I care to get into"

Lastly, intrinsic predispositions like empathy appeared to significantly impact an instructor's approach when managing a student with concussion.

…"I tend to be the over-trusting one [instructor]. I rarely find that a student will put something that important [injury] on the table and be lying about it. It's kind of the way I like to approach life. I just think it's a better way to live"

…"I love them. I do, I love my students. They're little people, they're far from home. I think they're stressed with being at this huge university and figuring it all out. And so I don't need to be one of their problems"

The opposing factors described here swayed instructor responses to various degrees. In turn, Figure 1. gives a visual interpretation of how each of these psychosocial variables foreseeably dictated an instructor's decision making.

Accommodating the Student

This final theme encompasses the instructor's approach to assisting a student recovering from concussion. This theme signifies that the student's injury has been

legitimized, via documentation or other psychosocial factors, and speaks to the duties in which instructor's feel responsible for executing, in addition to the feasibility of accommodation requests. Heavily inspired by the interview card sorting activities, the subthemes include a) instructor's role, and b) feasibility of the accommodation.

Instructor's Role. Card sorting activity 1 asked instructors to determine the members of a collegiate RTL team. Under the first criteria, 70% of instructors believed they were currently part of a RTL team. When asked to explain why they were not part of the team, the remaining 30% reported:

…"I've never been asked to be part of a return-to-learn team for injured students"

Under the second criteria, 95% of instructors believed that they should be part of a collegiate RTL team. Given this high percentage of self-inclusion, the follow-up question was asked, *"what role do you believe you should have on the team?"*. The responses were consistent:

…"Supportive. To help that student do as well as he/she can until they become a rehabilitated student"

…"To help that student become successful in my class despite the diagnosis of concussion"

…"My role is to receive input from other [team] members, and then to discuss with students, what are your goals? Do you want to wait a couple weeks? Do you want to try to fight through this? What are your goals, and how can I help you to achieve those?"

Instructors also consistently excluded three individuals from the RTL team, regardless of sorting criteria: parent, campus police, and coach. Instructors noted:

…"FERPA prevents me from having any conversations with parents"

…"Simply, campus police has nothing to do with Return to Learn…Coaches, they should have no authority over that"

Lastly, when asked to identify the most important member of the team, instructors were equally split between three members: medical provider, disability student services, and the student.

Feasibility of the Accommodation. The results from card sorting activity 2 are shown in Table 2. Across the sample's entirety, instructors perceived "wearing sunglasses" and "excused from exams" as the most and least feasible requests, respectively. When broken into quartiles, the most feasible requests (wear sunglasses in class, additional time on assignments, additional time on exams) represent academic adjustments, whereas the least feasible requests (decreased workload, excused from assignments, excused from tests) are classified as academic accommodations. Once these trends were identified, instructors were subsequently asked, *"what makes these requests less feasible, and these more feasible?"*. Regarding the least feasible requests, instructors responded:

…"We need to have demonstration of knowledge, which would come from assignments and tests, to be confident that this student is moving along an academic pathway and truly learning"

…"I need to know that they [students] know the material before they leave my class"

Regarding the most feasible requests, instructors responded:

…"I'm going to say this. These [pointing to the less feasible cards] are extra work for me"

…"The question of whether a person cares about a student [to accommodate them] is secondary to, do I, or don't I have time to deal with this"

The introduction of time as a constraint to helping a student by NTT instructors was an insightful addition to this subtheme. Upon further probing, we discovered that an instructor's rank may restrict their availability. Several NTT instructors commented on the suspected hardships they believed their TT colleagues would experience. One NTT instructor nicely summarized:

…"At an R1 institution, understand what's driving the bus. Research, publications. The teaching is important, but I think the research and the publications are more important. So you know, there are probably some individuals who think, "I'm teaching this class because I have to, but this [research] is really where I'm going to invest my time", and now I have to deal with a student in my class who has this condition that we don't know how or when it's going to resolve. And I have to deal with that when I'd rather be chasing a grant or writing a scholarly paper. So I could see where dealing with concussions are problematic for some in the academic setting"

A second instructor added:

…"Someone has a hundred things to do, they have time to do 10 of them, and now a student [with concussion] says "hey, can you meet?". And for a lecturer who's all about students and doesn't have this other research, says "sure you can come into my office and take this test that you missed". For a PhD [tenure-track] it's, I don't even know where to fit this in. It's a second priority of a second priority"

To explore if these claims held merit, we asked tenure-track instructors the following question, *"is there anything about being tenure track, or your job description and duties,*

that you think would impede you from assisting a student with a concussion?"

Responses included:

…"I don't think so. Not that comes to mind. I do compress my teaching into a very narrow window, so that I can focus on my research the bulk of my time during the year... I tend to take my teaching very seriously, and when I think about how students are paying to be in the classroom and the investment they're making, I view it as my job and moral responsibility to bring as much as I can to that context. And so my attitude toward compressing it is, yeah, my research is going to slow down a little bit during this period, of time, and that's something I've prepared for"

…"No, not that I can think of"

While only two TT instructors were asked this question during their interview, the remaining TT participants were followed up with via email to offer their input; however, no others replied.

Table 2. Accommodation Feasibility Rank Order

Adjustment / Accommodation	Average Value			
	Total Sample	Non Tenure-Track	Tenure-Track	Difference (Non Tenure vs Tenure)
additional time on assignments	1.1	1.2	1.0	0.2
additional time on exams	1.2	1.2	1.2	0.0
audio lectures	1.5	1.6	1.4	0.2
decreased workload	1.7	1.7	1.8	0.1
ear plugs	1.4	1.4	1.3	0.1
excused absence from class	1.2	1.3	1.0	0.3
excused from tests	2.4	2.4	2.3	0.1
excused from assignments	2.0	1.9	2.0	0.1
headphones	1.4	1.3	1.4	0.1
leave class early	1.3	1.4	1.1	0.3
limited computer work	1.5	1.7	1.2	0.5
paper notes	1.2	1.2	1.3	0.1
reducing screen brightness	1.7	1.7	1.7	0.0
rest breaks	1.2	1.3	1.1	0.2
taking tests in a quiet room	1.2	1.2	1.2	0.0

wear sunglasses in class	1.0	1.0	1.0	0.0

Average rank values of adjustments / accommodations reference a 1-3 scale, with a value closer to 1.0 representing a very feasible accommodation, and a value closer to 3.0 representing an accommodation that is not feasible at all.

DISCUSSION

This study is the first to gather an in-depth perspective of how collegiate instructors perceive and manage concussion in their classrooms. While each of the discovered themes independently represent an important aspect of concussion management, they collectively embody the landscape instructors must navigate as they attempt to support their students. Because this study offers the genesis of themes pertinent to collegiate RTL, our discussion will not inspire deductive reasoning or conclusions from the data. Instead, grounded theory allows us to insightfully discuss the implications of our data, and guide the aims of subsequent investigations with a higher degree of accuracy.

Awareness

Previous studies have expressed the importance of educating RTL team members about concussion in an effort to improve patient outcomes;[3,12,30] however, concussion awareness (external knowledge, previous experience) did not appear to influence our sample's consistent response to concussion management in the classroom. This contrasts previous research which indicates that knowledge discrepancies exist between academic disciplines. Specifically, business faculty and staff in a collegiate setting have exhibited significantly less knowledge and awareness of concussion versus health science and humanity disciplines.[12] Identifying this contradiction prompted us to question why our sample displayed a homogeneous understanding of concussion. One possible explanation can be offered by Mokris et al.[12], who indicated that awareness of concussion is significantly higher in collegiate faculty that have previously provided

accommodations to students with concussion, versus those who have not. Given that our inclusion criteria required previous experience with concussion in the classroom, we can corroborate Mokris' findings, and begin to understand the origin of our cohort's uniform voice towards concussion.

Despite an instructor's perceived knowledge of concussion, nearly all expressed a desire to receive medical documentation from students. The exception to this pattern was seen in instructors who conveyed an empathetic position towards their student's hardships. In fact, empathy appeared to greatly influence an instructor's decision to award accommodations even in the absence of such documentation (Figure 1.). Human behavior research would indicate that this trend was not simply a coincidence, as both sex and age have been identified as significant predictors of altruistic decision making; with older individuals and females revealing greater altruistic tendencies.[31] More importantly, altruistic decision making is significantly mediated by emotional empathy, instead of reasoning.[31] This supports two of our findings. First, it offers insight as to why instructors still desired medical documentation from students despite their knowledge of concussion or its effect on classroom activities. Second, it helps explain why an empathetic instructor provides students with a greater chance of receiving classroom accommodations when medical verification is absent. Contrary to previous research,[32] these findings collectively require us to question whether targeted concussion education is the most effective method for establishing uniform decision making from instructors. In fact, previous research buttresses this statement as Glang et al. reports how an online concussion course can significantly increase knowledge of concussion in general education teachers, but fails to instill long term (6 month) application of this knowledge

(p = 0.92).[33] This evidence suggests that concussion education does not lead to significant changes in classroom management of concussion, which in the context of our findings, would still leave instructors requesting medical documentation for legitimacy and guidance. We should note, however, that while concussion education may yet play a supportive role within collegiate RTL, perhaps access to medical care and diagnosis would yield greater uniformity of outcomes.

Researchers should also consider the unknown perspectives of instructors who have no exposure to concussion, no experience with it in the classroom, or both. Do these instructors display a different outlook towards concussion and its accommodation in the classroom? Also, if empathy truly effects instructor decision making, and is not significantly mediated by concussion awareness, then instructors who did not meet our inclusion criteria could theoretically exhibit similar decision making profiles as our sample. Future investigations should be mindful of these possibilities.

Legitimacy

Perhaps the most robust and consistent pattern to arise from this study was an instructor's desire to legitimize a student's request for accommodations. While instructors sought out expert opinion as a confirmation of disability, there were those who also highlighted the need to keep supportive opportunities fair and equally available within the class. Post-concussion accommodations often include privileges like extended time to complete assignments, however, allowing these requests for only one student prompts an instructor to seek a valid reason for doing so. Medical documentation will not only confirm a need for assistance, but will also maintain the status of a fair classroom environment. Interestingly, nearly all instructors expressed a

desire to receive medical documentation, however, no one addressed the possible struggles of obtaining such documents.

Requiring a student to receive medical care prior to granting accommodations not only ensures that the health of the student is under proper medical supervision, but it also imposes a financial burden upon them. In fact, this burden may be more tangible than expected, as nationwide survey data indicates that nearly 60% of colleges (150 public from 42 states and 133 private from 32 states) have concerns about under-insured students attending their institutions; as dictated by a student having ≥ $1,000 deductible plan.[34] To complicate matters further, some institutions do not offer health insurance plans to their students, or do not require students to carry health insurance while enrolled.[35-37] Of greater concern, however, is that disability service offices at select universities have clearly recognized concussion as a covered disability[38-40], while others have remained ambiguous in their scope[41-43]. Impressionably, this conveys the notion that students at certain institutions may not receive accommodations for their concussion. This is particularly troubling, considering that recent amendments to the Americans with Disabilities Act (ADA) marked the inclusion of traumatic brain injury as a recognized disability by the federal government, mandating that faculty provide accommodations when official documentation is endorsed by the institutions disability services office.[44] What's more, the ADA suspended its "transitory" regulation tied to disability criteria (i.e. < 6 months).[44] This means that individuals suffering from mild forms of brain trauma (i.e. concussions), despite its temporary nature, can still receive disability assistance. These amendments are the first ever to provide college students with guaranteed classroom accommodation following concussion; however, qualifying

for these services requires presentation of medical documentation outlining the disability, which to our previous point, may be a significant barrier for students to overcome. Furthermore, it should be clarified that a note from a qualified medical provider, while significant, is not the equivalent to an endorsed document from a school's disability services office; given that the former is a medical opinion, and the latter is a federally-backed call-to-action. Our participants, however, perceived both equally, which bodes well for students.

Until concussion injury is ubiquitously legitimized for college students, we must continue to wrestle with the intricate decision making that instructors undergo in the absence of medical documentation. As seen in Figure 1., the logistical and psychosocial characteristics of an instructor and their classroom can dictate the acquisition of concussion assistance. For instance, instructor responses seemed to tether a disadvantaged position to larger classes and undergraduate students (Figure 1.). Pragmatically, a large lecture hall does not afford an instructor the opportunity to gain an interpersonal connection with many of their students, and therefore could hinder an instructor's ability to view requests from those students as impartial or truthful. This was supported by the opinion that undergraduate students are *"not as serious in their scholarship"*. In contrast, teacher-student interactions within smaller classes were portrayed as *"intimate"* and *"personable"*, allowing instructors to learn about their students as individuals. Divergence between how instructors referenced large and small classes lends us valuable insight as to how concussion symptomology may be interpreted in each of these settings. To explain, concussion injuries are often accompanied by psychological symptom profiles (irritability, anxiety, sadness, etc.)

which are not always outwardly recognizable. In turn, having a pre-injury "baseline" of a student's behavior and tendencies within the classroom could not only alert an instructor as to any deviations from the student's norm, but also be used as evidence to support a student's undocumented claim of having a concussion. In addition to smaller classes, instructors also suggested that trust was implicitly given to graduate level students, given their assumed professional status. While this benefits students pursuing post-graduate studies, these students are typically not the majority enrolled at an institution, therefore leaving the larger student population in jeopardy. The overall uncertainty of how an instructor will internally rationalize a student's request for help is a predicament we refer to as "teacher roulette", which was hinted at by one instructor:

…*"You're [the student] kind of at their [the instructor] mercy. It's like, "oh, I got one that's accommodating….I hold the keys to all the gates, and the students know it"*

Classroom elements like size or graduate students pose an interesting, and perhaps biased, line of thought from instructors. Future investigations should cautiously explore and add clarity to these initial patterns. Moreover, the experiences of previously concussed undergraduate and graduate students should be gathered to see if their first-hand experiences substantiate the potential inequities identified here.

Accommodating the Student

An instructor's ability to help a student with concussion is seemingly corralled by what they believe their role to be, in addition to the feasibility of what is being requested of them. Consistently, our instructors believed that their role within a RTL team should be peripheral and responsive. This triangulates their desire to receive confirmation of injury from medical personnel. Additionally, no instructor identified themselves as the most

important member of the RTL team, reaffirming their position as a peripheral contributor. It should be noted, however, that the external stance of an instructor is not indicative of lessened importance. Instead, it is perhaps drawing attention to the view that concussion is first and foremost a medical issue, and while academic faculty and staff play a pivotal role in the seamless re-integration of academic tasks, the course of treatment should be directly supervised and adjusted by medically trained personnel. The rank order (Table 2.) of academic supports stratified which requests may face pushback by an instructor. Triangulation of this data to instructor responses allowed us to detect a temporal undertone associated with an accommodation's feasibility. Therefore, we hypothesize that instructor's views of feasibility stem from a balance between the work required to implement an academic support, and the time needed to do so. To explain, the academic supports that were scored as very feasible (wear sunglasses in class, additional time on assignments, additional time on exams) all possess a "hands off" quality, requiring no additional demand on the instructor. In contrast, somewhat feasible accommodations (audio lectures, limited computer work) may require instructors to create alternative assignments or separate audio recordings of their lectures. Therefore, it can be speculated that the implementation of an adjustment or accommodation by an instructor is inversely correlated to its time commitment. This correlation, however, does not appear to be the chief influence for the scoring of our least feasible accommodations (decreased workload, excused from assignments, excused from tests). Instead, instructor responses suggest that maintaining course integrity is the driving factor. Curriculums, particularly those within accredited programs, set forth a course of instruction designed to ensure that students

have acquired a specific level of skill and knowledge prior to degree maturation. In turn, instructors likely feel responsible to safeguard the standards of their respective departments by upholding the integrity and rigor of their individual courses. Additionally, courses within a curriculum are routinely arranged in a manner that requires a student to display pre-requisite knowledge prior to advancing to the subsequent course. Therefore, a student forgoing an entire exam/assignment would contradict this principle. It should be noted, that while excusing exams/assignments were labeled as unacceptable, all instructors reported that they would be willing to postpone these items until the student had recovered.

LIMITATIONS

The present study is not free of limitations. First, this study was conducted at a large, public institution; therefore, faculty at other colleges and universities (e.g. smaller, private, etc.) may possess idiosyncratic perspectives unique to their setting. Second, while adjunct instructors were eligible to participate, none volunteered, which necessitates their opinions be gathered as data indicates that nearly 50% of the faculty positions at degree granting institutions are adjunct or part-time.[45] Third, our cohort included five academic disciplines, however, 65% belonged to a college of Public Health, requiring future works to achieve more even representation. Lastly, because certain health disparities are the result of race and ethnicity, it is possible that an instructor's perspective towards injury and illness is influenced by their background. Because the studied university is comprised of only 20% minority faculty,[46] ethnic and racial heterogeneity must be a chief component of follow-up inquiry.

CONCLUSION

This is the first study to outline RTL management in the collegiate setting. Of primary importance, the themes generated here not only illustrate the foundational characteristics of collegiate RTL, but also provide a platform for future collegiate RTL research to build from. Medical verification of concussion has emerged as a significant theme within the college setting, and when absent, renders students open to the unpredictable rationale of their instructors. The impact of concussion education efforts on collegiate faculty is also under question, as the various levels of concussion awareness among instructors did not appear to alter their inclination to legitimize a student's claims. Instructors also wished to receive medical guidance as peripheral members of the RTL team, and may be reluctant to implement accommodations that infringe upon the integrity of their course, or require significant time commitments. The presented findings, while not universally transferable, are meant to represent a credible, transparent, and robust depiction of our cohort's voice regarding the management of concussion within the classroom.

Acknowledgements: The authors acknowledge the support of the 23 instructors who voluntarily participated in this research.

Author Contributions: ZWB designed the research idea. DJC, DMK, TFL, and KK refined the study protocol and study implementation. DJR acted as the second coder of the data. All the authors contributed to the writing and editing of the manuscript.

Funding statement: This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests: The authors have no competing interests to disclose.

Ethics approval: Ethics approval to conduct this research was received from X University Institutional Review Board, and given exempt status.

Data statement: Technical appendix, statistical code, and dataset available from the Dryad repository, DOI: [include DOI for dataset here].

Figure Caption: Figure 1. No Note Provided: Factors Influencing an Instructor's Decision to Allow Accommodations.

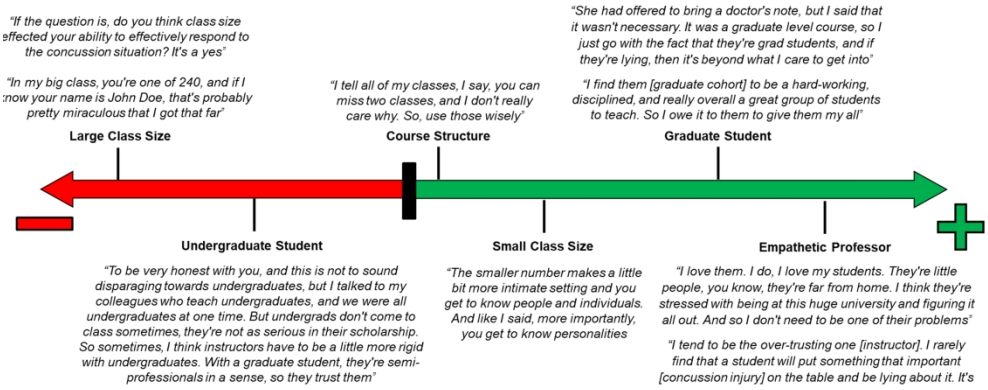
REFERENCES

1. McCrory P, Meeuwisse W, Dvorak J, et al. Consensus statement on concussion in sport-the 5(th) international conference on concussion in sport held in Berlin, October 2016. *Br J Sports Med.* 2017;51(11):838-847.
2. DeMatteo CA, Randall S, Lin CA, Claridge EA. What Comes First: Return to School or Return to Activity for Youth After Concussion? Maybe We Don't Have to Choose. *Front Neurol.* 2019;10:792.
3. Purcell LK, Davis GA, Gioia GA. What factors must be considered in 'return to school' following concussion and what strategies or accommodations should be followed? A systematic review. *Br J Sports Med.* 2019;53(4):250.
4. Corwin DJ, Wiebe DJ, Zonfrillo MR, et al. Vestibular Deficits following Youth Concussion. *J Pediatr.* 2015;166(5):1221-1225.
5. Purcell L, Harvey J, Seabrook JA. Patterns of Recovery Following Sport-Related Concussion in Children and Adolescents. *Clin Pediatr (Phila).* 2016;55(5):452-458.
6. Ransom DM, Burns AR, Youngstrom EA, Vaughan CG, Sady MD, Gioia GA. Applying an Evidence-Based Assessment Model to Identify Students at Risk for Perceived Academic Problems following Concussion. *J Int Neuropsychol Soc.* 2016;22(10):1038-1049.
7. Ransom DM, Vaughan CG, Pratson L, Sady MD, McGill CA, Gioia GA. Academic effects of concussion in children and adolescents. *Pediatrics.* 2015;135(6):1043-1050.
8. Brown NJ, Mannix RC, O'Brien MJ, Gostine D, Collins MW, Meehan WP, 3rd. Effect of cognitive activity level on duration of post-concussion symptoms. *Pediatrics.* 2014;133(2):e299-304.
9. Darling SR, Leddy JJ, Baker JG, et al. Evaluation of the Zurich Guidelines and exercise testing for return to play in adolescents following concussion. *Clin J Sport Med.* 2014;24(2):128-133.
10. Makki AY, Leddy J, Hinds A, et al. School Attendance and Symptoms in Adolescents After Sport-Related Concussion. *Glob Pediatr Health.* 2016;3:2333794x16630493.
11. Lovell MR, Collins MW, Iverson GL, et al. Recovery from mild concussion in high school athletes. *J Neurosurg.* 2003;98(2):296-301.
12. Mokris R, Kessler, A, Williams, K, Ranney, J, Webster, J, Stauffer, K. Assessing concussion knowledge and awareness in faculty and staff in a collegiate setting. *Journal of Concussion.* 2019;Volume 3: 1–11.
13. Bevilacqua ZW, Kerby ME, Fletcher D, et al. Preliminary evidence-based recommendations for return to learn: a novel pilot study tracking concussed college students. *Concussion.* 2019;4(2):Cnc63.
14. Runyon LM, Welch Bacon CE, Neil ER, Eberman LE. Understanding the Athletic Trainer's Role in the Return-to-Learn Process at National Collegiate Athletic Association Division II and III Institutions. *J Athl Train.* 2020.
15. Statistics NCfE. Nontraditional Undergraduates. In: Education USDo, ed2013.

16. Arnett JJ. Emerging adulthood. A theory of development from the late teens through the twenties. *Am Psychol.* 2000;55(5):469-480.
17. Corwin DJ, Zonfrillo MR, Master CL, et al. Characteristics of prolonged concussion recovery in a pediatric subspecialty referral population. *J Pediatr.* 2014;165(6):1207-1215.
18. Rosenbaum PE, Locandro C, Chrisman SPD, et al. Characteristics of Pediatric Mild Traumatic Brain Injury and Recovery in a Concussion Clinic Population. *JAMA Netw Open.* 2020;3(11):e2021463.
19. Black AE, Deci EL. The effects of instructors' autonomy support and students' autonomous motivation on learning organic chemistry: A self-determination theory perspective. *Science Education.* 2000;84(6):740-756.
20. Richmond AS, Berglund MB, Epelbaum VB, Klein EM. a + (b1) Professor–Student Rapport + (b2) Humor + (b3) Student Engagement = (Ŷ) Student Ratings of Instructors. *Teaching of Psychology.* 2015;42(2):119-125.
21. Rogers DT. Further Validation of the Learning Alliance Inventory:The Roles of Working Alliance, Rapport, and Immediacy in Student Learning. *Teaching of Psychology.* 2015;42(1):19-25.
22. Ryan RG, Wilson JH, Pugh JL. Psychometric Characteristics of the Professor–Student Rapport Scale. *Teaching of Psychology.* 2011;38(3):135-141.
23. Sheldon KM, Krieger LS. Understanding the Negative Effects of Legal Education on Law Students: A Longitudinal Test of Self-Determination Theory. *Personality and Social Psychology Bulletin.* 2007;33(6):883-897.
24. Wilson JH, Ryan RG. Professor–Student Rapport Scale:Six Items Predict Student Outcomes. *Teaching of Psychology.* 2013;40(2):130-133.
25. Benson T, Cohen, AL, Buskist, W Rapport: Its relation to student attitudes and behaviors toward teachers and classes *TEACHING OF PSYCHOLOGY* 2005;32 (4):237-239
26. Demir M, Burton S, Dunbar N. Professor–Student Rapport and Perceived Autonomy Support as Predictors of Course and Student Outcomes. *Teaching of Psychology.* 2019;46(1):22-33.
27. Tisdell Ma. *Qualitative research : a guide to design and implementation.* Wiley; 2016.
28. Strauss Ca. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory.* 2nd ed: Sage Publications; 1998.
29. Lincoln YG, E. *Naturalistic Inquiry* Sage Publications; 1985.
30. Sarmiento K, Donnell Z, Bell E, Hoffman R. From the CDC: A qualitative study of middle and high school professionals' experiences and views on concussion: Identifying opportunities to support the return to school process. *J Safety Res.* 2019;68:223-229.
31. Rosen JB, Brand M, Kalbe E. Empathy Mediates the Effects of Age and Sex on Altruistic Moral Decision Making. *Front Behav Neurosci.* 2016;10:67.
32. Finn C. Effects of a faculty training program on knowledge and awareness of student concussion and academic performance. *J Am Coll Health.* 2020:1-8.
33. Glang AE, McCart M, Slocumb J, et al. Preliminary Efficacy of Online Traumatic Brain Injury Professional Development for Educators: An Exploratory Randomized Clinical Trial. *J Head Trauma Rehabil.* 2019;34(2):77-86.

34. Association ACH. *Student Health Insurance/Benefit Plans: Adapting to the Environment Post Affordable Care.* 2014.
35. Alabama Uo. Insurance Information. Student Health Center and Pharmacy https://shc.sa.ua.edu/billing/insurance-information/. Accessed 7/21/2020.
36. Michigan Uo. Health Services and Insurance Educational and Support Services. https://www.law.umich.edu/currentstudents/studentservices/handbook/edusupsvcs/Pages/UniversityHealthServices.aspx. Accessed 7/21/20.
37. University TAM. Health Insurance. Student Health Services. https://shs.tamu.edu/insurance/. Accessed 7/21/20.
38. Oregon Uo. What is Disability? Accessible Education Center. https://aec.uoregon.edu/content/what-disability. Accessed 7/21/20.
39. Vermont Uo. Documentation Guidelines Center for Academic Success. https://www.uvm.edu/academicsuccess/documentation-guidelines. Accessed 7/21/20.
40. Michigan Uo. Acquired/Traumatic Brain Injury. Services for Students with Disabilities. https://ssd.umich.edu/article/acquiredtraumatic-brain-injury-abitbi. Accessed 7/21/20.
41. College V. Disability Accommodations and Support Services Policy. Accessibility and Educational Opportunity. https://accessibilityandeducationalopportunity.vassar.edu/Students/disability-guidelines/. Accessed 7/21/20.
42. Georgia Uo. Temporary Impairments Disability Resource Center. https://drc.uga.edu/site/content_page/temporary-impairments. Accessed 7/21/20.
43. University FS. Documentation Guidelines. Department of Student Support and Transitions. https://dsst.fsu.edu/oas/students/applying-for-services/documentation-guidelines. Accessed 7/21/20.
44. Division UDoJCR. *Final Rule Implementing the ADA Amendments Act of 2008.* 2016.
45. Statistics NCfE. Number of instructional faculty in degree-granting institutions, by employment status, sex, control, and level of institution: Selected years, fall 1970 through fall 2011. In.
46. Bloomington IU. *Full-time Faculty and Staff Headcount by Race and Ethnicity.* 2019.

Figure 1. No Note Provided: Factors Influencing an Instructor's Decision to Allow Accommodations



2534x1131mm (96 x 96 DPI)

APPENDIX A

Opening questions

1. Tell me how long you've been working at your current institution, and what you teach?

2. Where have you heard the term concussion before?
    a. From those sources, what exactly did you learn about concussion?

Investigative Questions

3. You reported that you've had at least one concussed student in your class. Can you tell me more about that experience?

    a. Your experience sounded ___ . Would you say educators need something more in order to better help concussed students? Or do you think the current process is working well?
        i. IF guidelines are mentioned, or MD directions are mentioned, then ask this probe
            1. Do you think it is within a teacher's expertise to be making decisions of academic participation for a concussed student?
        ii. Did you know what their needs were?
        iii. Did you feel prepared to handle that student's needs?
            1. Yes: what would you say prepared you?
            2. No: what type of preparation would you say is missing

4. Here are some cards with different academic adjustments and accommodations written on them. I'd like you to place each of these cards in one of the three piles here based on how feasible you believe these are to implement in your school and classroom. (Piles: not feasible at all, somewhat feasible, absolutely feasible)

    a. Overall, what accommodation/adjustment are teachers in your discipline most likely to implement? Least likely to implement?

5. Currently, 9 states observe legislation which mandates high schools to have protocols for gradually returning students with concussion back into the classroom setting. Do you think this type of policy-making should make its way into the collegiate setting?

    a. So you believe these policies should be in collegiate education. What would you say is the first step in making something like this happen?
    b. So you believe college educators should not be responsible for this. What thoughts comprise that statement?

6. Here is an example of an medical note (appendix G) for a concussed student that a teacher might receive. Please take your time to read over it, and tell me what aspects of this note you like, don't like, find helpful, and then we'll discuss your impressions?

    a. What do you find helpful about this note?
    b. What would you say is missing that you would like to receive from a note
    c. Here is another note that an educator might receive (appendix Hf). Do you find this version more/less helpful, and why?
    d. Has a medical professional ever directly reached out to you about a student's concussion?
        i. Who have you spoken with? What was said?

7. Return to learn is a phrase that describes the process of re-integrating a student with concussion back into the classroom after a head injury. Here are some cards with different individuals written on them. I'd like you to place all the individuals you believe to currently be part of the RTL team in this pile labeled "RTL Team", and those who aren't in this pile labeled "Non-member"

    a. I see that you placed "the student's teacher" in the "RTL Team" pile. why is that? What role do you feel you as a teacher have?
    OR
    b. I see that you *did not* place "the student's teacher" in the "RTL Team" pile, why is that? Why do you feel teachers are excluded?
        i. Either case = do you think teachers should play a more central role on the team? Why?
    c. This is who you currently believe to be part of the RTL team. I'd like you to now arrange these individuals based on who you believe should be part of the team, and who shouldn't

8. Are there any key points we haven't talked about that you fell are important for teachers, medical providers, and for me to know?

APPENDIX A *(amended 2/9/20)*

Opening Questions

1. Tell me how long you've been working at your current institution, and what you teach?

2. When I say the term concussion, what comes to mind?
    a. From those sources, what exactly did you learn about concussion?

Investigative Questions

3. You reported that you've had at least one concussed student in your class. Can you tell me more about that experience? How did you hear? Who did you communicate with? Etc.
4. Here are some cards with different academic adjustments and accommodations written on them. I'd like you to place each of these cards in one of the three piles here based on how feasible you believe these are to implement in your school and classroom. (Piles: not feasible at all, somewhat feasible, very feasible)

    a. Would you change any of your answers if the class size were big? Small?

5. Here is an example of a medical note (appendix G) for a concussed student that a teacher might receive. Please take your time to read over it, and tell me what aspects of this note you like, don't like, find helpful, and then we'll discuss your impressions?

    a. What do you find helpful about this note?
    b. What would you say is missing that you would like to receive from a note
    c. Here is another note that an educator might receive (appendix H). Do you find this version more/less helpful, and why?
    d. Because this note is from DSS, does that hold any significance to you?
6. Return to learn is a phrase that describes the process of re-integrating a student with concussion back into the classroom after a head injury. Here are some cards with different individuals written on them. I'd like you to first place all the individuals you believe to currently be part of the RTL team in this pile labeled "RTL Team", and those who aren't in this pile labeled "Not RTL". Then I'd like you to arrange these individuals based on who you believe should be part of the team, and who shouldn't.

    a. I see that you did/did not place "teacher/professor" in the "RTL Team" pile. Why is that? What role do you feel you as a teacher have?
    b. Who is the most important person on the team, or point person?

7. Why do you feel as though you're as accommodating as you are? Is it because you've received a medical note? Is it who the note comes from? Is it something you believe you should do? Is it something you believe is required of you?

8. Are there any key points we haven't talked about that you fell are important for teachers, medical providers, and for me to know

APPENDIX B

* Each row will be its own separate index card, and will be given to the participant collectively to sort

Medical Doctor / Diagnosing Medical Provider

Athletic Trainer

Student's Coach

Counseling and Psychological Services

Student's Academic Advisor

Campus Disability Services

Professor

Campus Police

Parent/Guardian

Student

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

No	Item	Guide questions/description
	Domain 1: Research team and reflexivity	
	Personal Characteristics	
1.	Interviewer/facilitator	ZWB conducted the interviews
2.	Credentials	Ph.D., ATC
3.	Occupation	University Educator
4.	Gender	Male
5.	Experience and training	Researcher was trained in college pedagogy, qualitative methods and analysis, and has an expertise in clinical neurotrauma
	Relationship with participants	
6.	Relationship established	No
7.	Participant knowledge of the interviewer	Participants only knew that this research was being conducted to gather their perspectives on concussion management in the classroom.
8.	Interviewer characteristics	No bias was reported about either coder, nor the interviewer
	Domain 2: study design	
	Theoretical framework	
9.	Methodological orientation and Theory	Grounded theory
	Participant selection	
10.	Sampling	Purposive
11.	Method of approach	Email
12.	Sample size	23
13.	Non-participation	84 people either did not meet inclusion criteria, or declined
	Setting	
14.	Setting of data collection	University campus
15.	Presence of non-participants	No
16.	Description of sample	12 males (11 White, 1 Latino) and 11 females (10 White, 1 Latino), 14 non-tenure track and 9 tenure-track educators
	Data collection	
17.	Interview guide	Created by the authors
18.	Repeat interviews	No
19.	Audio/visual recording	Yes, audio recordings
20.	Field notes	Interviewer took notes during the interview as appropriate
21.	Duration	Average 62 minutes
22.	Data saturation	Yes, data saturation was reached
23.	Transcripts returned	Yes
	Domain 3: analysis and findings	
	Data analysis	
24.	Number of data coders	2
25.	Description of the coding tree	No
26.	Derivation of themes	Derived from the data
27.	Software	Microsoft Word
28.	Participant checking	No
	Reporting	
29.	Quotations presented	Yes, but were not identified
30.	Data and findings consistent	Yes
31.	Clarity of major themes	Yes
32.	Clarity of minor themes	Yes

BMJ Open

Educator Perspectives on Concussion Management in the College Classroom: a Grounded Theory Introduction to Collegiate Return-to-Learn

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2020-044487.R2
Article Type:	Original research
Date Submitted by the Author:	20-Feb-2021
Complete List of Authors:	Bevilacqua, Zachary ; Rochester Institute of Technology, Exercise Science Cothran, Donetta; Indiana University Bloomington, Kinesiology Rettke, Devin; Indiana University Bloomington, Kinesiology Koceja, David; Indiana University Bloomington, Kinesiology Nelson-Laird, Thomas; Indiana University Bloomington, Kinesiology Kawata, Keisuke; Indiana University Bloomington, Kinesiology
Primary Subject Heading:	Rehabilitation medicine
Secondary Subject Heading:	Health policy, Neurology, Patient-centred medicine, Qualitative research
Keywords:	Neuropathology < NEUROLOGY, TRAUMA MANAGEMENT, PUBLIC HEALTH

I, the Submitting Author has the right to grant and does grant on behalf of all authors of the Work (as defined in the below author licence), an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the terms applicable for US Federal Government officers or employees acting as part of their official duties; on a worldwide, perpetual, irrevocable, royalty-free basis to BMJ Publishing Group Ltd ("BMJ") its licensees and where the relevant Journal is co-owned by BMJ to the co-owners of the Journal, to publish the Work in this journal and any other BMJ products and to exploit all rights, as set out in our licence.

The Submitting Author accepts and understands that any supply made under these terms is made by BMJ to the Submitting Author unless you are acting as an employee on behalf of your employer or a postgraduate student of an affiliated institution which is paying any applicable article publishing charge ("APC") for Open Access articles. Where the Submitting Author wishes to make the Work available on an Open Access basis (and intends to pay the relevant APC), the terms of reuse of such Open Access shall be governed by a Creative Commons licence – details of these licences and which Creative Commons licence will apply to this Work are set out in our licence referred to above.

Other than as permitted in any relevant BMJ Author's Self Archiving Policies, I confirm this Work has not been accepted for publication elsewhere, is not being considered for publication elsewhere and does not duplicate material already published. I confirm all authors consent to publication of this Work and authorise the granting of this licence.

Educator Perspectives on Concussion Management in the College Classroom: a Grounded Theory Introduction to Collegiate Return-to-Learn

Word Count: 5780

Zachary W. Bevilacqua, Ph.D., ATC
Department of Exercise Science, Wegmans School of Health and Nutrition
Rochester Institute of Technology, Rochester, New York, USA

*** Corresponding Author:**
Zachary W. Bevilacqua, Ph.D., ATC
(585) 313-4608
zwbihst@rit.edu

Donetta J. Cothran, Ph.D.
Department of Kinesiology, School of Public Health-
Bloomington, Indiana University, Bloomington, Indiana, USA
dcothran@indiana.edu

Devin J. Rettke, MS
Clinical Neurotrauma Laboratory, Department of Kinesiology, School of Public Health-
Bloomington, Indiana University, Bloomington, Indiana, USA
drettke@iu.edu

David M. Koceja, Ph.D.
Department of Kinesiology, School of Public Health-
Bloomington, Indiana University, Bloomington, Indiana, USA
koceja@indiana.edu

Thomas F. Nelson-Laird, Ph.D.
Department of Kinesiology, School of Public Health-
Bloomington, Indiana University, Bloomington, Indiana, USA
tflaird@indiana.edu

Keisuke Kawata, Ph.D., ATC
Clinical Neurotrauma Laboratory, Department of Kinesiology, School of Public Health-
Bloomington, Indiana University, Bloomington, Indiana, USA
kkawata@indiana.edu

Keywords: Return to Learn, RTL, Concussion, College, Educator

Educator Perspectives on Concussion Management in the College Classroom: a Grounded Theory Introduction to Collegiate Return-to-Learn

ABSTRACT

Objectives: To gather the perspectives of collegiate instructors regarding how concussion is managed within the college classroom. To introduce the themes surrounding collegiate Return-to-Learn (RTL) and the classroom management of students with concussion.

Design: Qualitative grounded theory

Setting: Large, public university in the Midwest

Participants: Twenty-three college instructors participated in a private, semi-structured, audio-recorded, one-on-one interview. Participants included 12 males and 11 females. Interview recordings were transcribed verbatim, followed by an iterative process of open- and axial-coding, performed by two researchers.

Results: Three themes emerged from the coded data: 1) Awareness- external knowledge of concussion & previous experiences, 2) Legitimacy- medical note provided & no note provided, and 3) Accommodating the Student- instructor's role & feasibility of the accommodation. Psychosocial factors such as small class sizes, graduate-level students, and an instructor's empathy appeared to influence an instructor's decision making when accommodating a student recovering from concussion.

Conclusions: These novel data provide foundational evidence regarding how college instructors perceive and subsequently manage concussion within the classroom, while also offering accuracy to aims of subsequent collegiate RTL investigations

Article Summary: RTL is an emerging field within concussion management, yet is grossly underexplored within the college setting. By utilizing a grounded theory approach, this article introduces the themes that dictate the landscape of return-to-learn for a college student.

Strengths and limitations of this study:

- A grounded theory approach was used to discover the themes surrounding this unexplored field of collegiate RTL
- One-on-one interviews allowed participants to express private and individualized perspectives
- Six trustworthiness measures significantly mitigated author bias
- Data was gathered from a variety of instructors, however, a School of Health represented 65% of the study sample
- The data represents the views of a large, public university, and may not be widely transferable to other (smaller, private) universities

INTRODUCTION

In recent years, management of concussion injury in school aged individuals has been centered around re-integrating students back to the athletic field, known as return-to-

play (RTP), as well as the classroom, referred to as return-to-learn (RTL). RTL is a gradual, individualized process that parallels RTP in both its aim, as well as its importance. In fact, literature would indicate that completion of a RTL progression should take priority over a RTP progression,[1] as consensus statement guidelines state that "children and adolescents should not return to sport until they have successfully returned to school".[1] Furthermore, DeMatteo asked the question of "what comes first" between RTL and RTP, and found that while these protocols can successfully be completed in tandem, the final stages of a RTP protocol should be postponed until a RTL progression has been fulfilled.[2] Despite its significant position within the spectrum of concussion management, RTL surprisingly remains overshadowed by RTP studies.

To date, systematic review of RTL data has concluded that factors like age, grade level, and course load must all be considered when returning a student to the classroom.[3] For example, high school students reported a greater quantity and severity of symptoms, in addition to experiencing a delayed RTL, versus both middle and elementary students.[4-7] Moreover, high school students had significantly more school related problems, diminished academic skills, and increased concerns about the academic repercussions of their injury, again versus middle and elementary students.[7] Lastly, inappropriately timed increases in both cognitive load and school attendance were seen to exacerbate symptomology.[4,8-11] These findings collectively suggest that a relationship exists between higher levels of academia and increased post-concussion difficulties; yet, the extent of this link is unknown, given that RTL research has produced minimal findings beyond the high school setting.[12-14]

The lack of college-aged RTL data is puzzling, considering that the collegiate environment presents students with several distinct challenges. For instance, because attending college incurs a financial undertaking, students may have to carry part-time employment simultaneous to engaging in highly competitive and rigorous curricula.[15] Students are also tasked, possibly for the first time, with living on their own or among unfamiliar persons of different ethnicities, socioeconomic backgrounds, countries, and ages.[16] Lastly, college students are viewed as autonomous learners, which requires them to quickly adopt effective adult-like traits, such as time management. By acknowledging the various challenges that a college student encounters, coupled with the association between pre-morbid anxiety levels and prolonged concussion recovery,[17,18] it is reasonable to suggest that appropriate support within the classroom could alleviate the cumulative stress that students encounter while on campus. In fact, a significant body of literature would attest to the importance of instructor-student interactions, and its positive effect on outcomes like attitudes towards courses, increased studying, and higher average grades.[19-26] In the event of a concussion, an instructor could continue to exhibit this support, chiefly through the implementation of classroom accommodations. Instructors also have the greatest amount of school-related contact time with students, making their perspectives on how students with concussion are supported throughout their recovery, increasingly valuable.

Because college students experience a unique set of stressors and circumstances, it becomes prudent to explore the characteristics specific to this setting. Furthermore, due to the paucity of college-aged RTL data, investigators should begin this exploration by utilizing an approach that will uncover the foundational themes within the college

setting. In doing so, subsequent research will have a backdrop in which to reference, offering accuracy to future aims. Therefore, by implementing a qualitative grounded theory approach, the current study sought to use the perspectives of those close to students, collegiate instructors, to introduce the themes surrounding collegiate RTL and the classroom management of students with concussion.

METHODS

Participants

Twenty-three college instructors from a large, public institution, were included. Participants were derived from five schools on campus: Public Health, Business, Education, Public & Environmental Affairs, and Optometry. Participants satisfied two inclusion criteria, 1) current non tenure-track (NTT), tenure-track (TT), adjunct (ADJ) faculty with teaching responsibilities, and 2) have previously taught a student with concussion in the college classroom within the past 10 years (not in a physical activity setting). We chose to exclude experience within physical activity based courses considering that they place a demand on cardiorespiratory physiology, which resembles a return-to-play course of management. Eligible participants were identified via Qualtrics survey (Qualtrics Survey Software®), distributed by email. Once identified, participants voluntarily signed an informed consent, demographics were gathered (Table 1.), and the interview was conducted. Permission to conduct interviews was given by the X Institutional Review Board, and given exempt status.

Table 1. Demographics

School	Sex	Age	Ethnicity	Teaching in College (in years)	Rank	Instructed Concussed Students (past 10 years)	Class Sizes	RTL Protocol	Previous Experience w Concussion

PH	F	60-69	White	22	NTT	3	40 - 240	Unsure	Yes
	M	30-39	White	15	NTT	10	3 - 15	Unsure	No
	F	30-39	White	10	NTT	7	10 - 45	No	Yes
	F	50-59	White	20	NTT	5	30 - 40	Unsure	Yes
	F	30-39	White	6	NTT	2	25 - 125	Unsure	No
	F	50-59	White	28	NTT	3	15 - 25 - 40 - 150	Yes	Yes
	F	50-59	White	29	NTT	2	1 - 10 - 100 - 250	Yes	Yes
	M	60-69	White	27	NTT	1	5 - 20	Unsure	Yes
	M	50-59	White	8	NTT	2	30 - 60	Yes	Yes
	M	50-59	White	17	NTT	1	8 - 12 - 38	Unsure	No
	M	50-59	Latino	25	TT	2	10 - 25 - 70	Unsure	No
	M	60-69	White	31	TT	5	10 - 150	Unsure	Yes
	F	60-69	White	40	TT	1	30 - 50	No	No
	F	40-49	Latino	9	TT	2	10 - 30 - 50	Unsure	No
	F	30-39	White	15	TT	1	3 - 12 - 85 - 100	Unsure	Yes
BUS	M	30-39	White	6	NTT	3	30 - 40	Yes	No
	F	50-59	White	10	NTT	18	24 - 35 - 40 - 80	Unsure	No
	M	70-79	White	45	NTT	10	24 - 100 - 200	Yes	Yes
	M	50-59	White	26	NTT	2	15 - 275	Unsure	No
	M	30-39	White	7	TT	2	20 - 40	Unsure	Yes
ED	F	70-79	White	40	TT	2	5 - 24	Yes	Yes
OPT	M	50-59	White	14	TT	2	10 - 80	Yes	Yes
PEA	M	40-49	White	15	TT	2	8 - 60 - 100	Unsure	Yes

PH – Public Health, BUS - Business, ED - Education, OPT - Optometry, PEA – Public & Environmental Affairs, NTT – Non Tenure-Track, TT – Tenure-Track

Patient and Public Involvement

No patients involved.

Interview

Data collection was performed using a semi-structured, private, audio recorded, one-on-one interview approach. Interviews took an average 62 minutes to complete, were recorded using a voice recorder, and were conducted in a closed-door location of the instructor's choosing. The interview guide (Appendix A) consisted of 8 semi-structured questions, which affords the interviewer latitude to alter question order, to extract

extensive detail from the instructor.[27] All interviews were conducted by a single researcher.

Interactive Materials- Card Sorting Activity 1

Within the interview, instructors were asked to sort 10 index cards, each of which containing the name of an individual or entity on a college campus (Appendix B). Cards were sorted into one of two categories, identifying whether an individual(s) was part of the "RTL team", or "not RTL". Furthermore, instructors were asked to sort these cards twice, first using the criteria *"who do you believe is currently part of a return-to-learn team on campus?"*, and then a second time using the criteria *"if you were in charge of creating a return-to-learn team for campus, who would you include?"*.

Interactive Materials- Card Sorting Activity 2

Instructors performed another card sorting activity, analogous to the one described previously; however, this activity required instructors to rank the feasibility of 16 commonly requested RTL adjustments and accommodations into one of three categories: "very feasible", "somewhat feasible", "not feasible at all". The feasibility ranking referred to an instructor's ability to implement that accommodation in the classes they teach. The chosen accommodations were taken from previous work by the authors.[13]

Transcription

Each interview was transcribed verbatim, as to capture useful vernacular used by instructors. The online transcribing software service Temi™ was used to transcribe the interviews. The final accuracy of the transcript was carefully reviewed by the same researcher who conducted the interviews.

Data Analysis

Two researchers used inductive reasoning to independently open- and axially-code all transcripts.[28] Collegiate RTL is an unexplored field, and as such requires a grounded theory approach to inductively generate novel themes for future research. Using Microsoft Word®, segments of text were assigned codes, embodying their meaning. Codes of similar nature were grouped together to identify their overarching theme,[28] and final codes were matched and confirmed between both coders, through an iterative discussion process. Two mandatory criteria needed to be satisfied for a theme to be considered overarching and significant: 1) the theme had to include matching codes from at least 80% of the sample, and 2) themes must possess enough heterogeneity between one another. Ensuring heterogeneity between themes confirms that all themes truly represent a robust, yet standalone, characteristic of the research. The cutoff of 80% representation was selected as it indicates significant homogeneity among instructor perspectives, without unnecessarily excluding themes that could not reach unanimous representation. Subthemes were also independently identified by each coder. Following the initial round of subtheme identification, final subthemes were agreed upon by both coders, again through an iterative discussion process. To report the overall perceived feasibility of an accommodation from card sorting activity 2, each category was assigned a numerical value (very feasible = 1, somewhat feasible = 2, not feasible at all = 3). Each time an accommodation was considered “very feasible” by an instructor, it would receive a score of 1; and so on for the remaining two categories. With this, an average feasibility value could be calculated for each individual

accommodation. Feasibility values were calculated for the collective sample, as well as NTT and TT cohorts individually.

Trustworthiness Measures

Trustworthiness, or methodological rigor, was maintained through credibility methods[29] (triangulation, member checks, peer debriefing, two-coders) and confirmability methods[29] (audit trail, journaling). Utilizing several measures ensured that researcher bias was substantially mitigated during all stages of the investigation.

RESULTS

Collectively, 89 codes were consolidated into three overarching themes 1) awareness, 2) legitimacy, and 3) accommodating the student. These themes, and their accompanying subthemes, embodied instructor's perspectives regarding concussion in the classroom. Here the crux of each theme will be presented, and supported with instructor quotes.

Awareness

The first theme of awareness refers to an instructor's broad exposure to concussion. This exposure can be dichotomized into a) external knowledge of concussion, and b) internal previous experiences, of which instructors could possess one, or both.

External Knowledge of Concussion. Several instructors derived their understanding of concussion from a variety of sources (news, television, scholarly research, etc.), yet, no one external source appeared to predominate. For example, when asked the question *"when I mention the word concussion, what thoughts come to mind? And what sources are you drawing from?"*, instructors responded:

…"I am up to date more than most, especially because we have concussion research that happens in our own school, in our own department"

…"I know the news side, the CTE's in the NFL players"

…"I'm sure you're familiar with the scene from The Office where Dwight gets a concussion. He ran his car into a fence and gets a concussion, jumps out of his car and throws up, and then immediately gets back in his car and starts driving. And then for the rest of the day he's a little bit off… he's not himself and his brain doesn't seem to be able to keep itself on track and focus"

Previous Experiences. When asked the same question regarding concussion, some instructors recollected personal experiences as their primary source of understanding concussion. Again, answers differed in detail, however, having a personal history or exposure to concussion (sustained themselves, by a friend/family member, or professional experience working with concussion patients) afforded these instructors to offer greater detail regarding the symptomology and pathology of concussion. Examples of greater detail included:

…"The brain actually smashes against the skull. There's headaches, cognitive challenges, concerns with noises, bright lights. But these are all personal experiences. I also think of potential brain injury, brain swelling"

…"I have a friend who had a midbrain injury with concussion. She went over the handlebars on her bike, had a helmet on, still ended up with a midbrain concussion. She had vertigo, headache, and all kinds of problems that went on for almost two years"

…"I worked inpatient psych on a locked unit with adolescents before I came back to the collegiate environment. [I] Came to understand and appreciate the brain in different ways"

Legitimacy

This second theme of legitimacy represents how instructors internally substantiate a student's claim of having a concussion, and their request for accommodations. Concussion is not always an outwardly recognized injury, and as such, obscures an instructor's already limited ability to identify the presence of a student in need of accommodation. In turn, this theme focused heavily upon the presence of a medical note, indicating that an injury was present, and that medical care was received. The resulting subthemes were a) medical note provided, or b) no note provided.

Medical Note Provided. Responses revealed several reasons as to why an instructor would rely upon a medical note prior to awarding accommodations to a student. Perhaps the simplest reason is that instructors acknowledge that they should look to the medical professionals for the health status of their students. For example:

…"the legitimacy comes from the external note, or email. I wouldn't trust my own instincts on something medical, I wouldn't have a clue. So I rely completely on the people who are the professionals"

…"it was helpful in that I was given information directly from the medical professional because it helped me provide legitimacy to the claim. I'm sure you can imagine there are often a variety of claims about different types of things, and so it's very helpful when you immediately get the notice"

…"If there's some sort of indication [doctor note or university email] that there's a challenge with a student, and they've spoken with us [instructor], and it's legitimate, it's very helpful. It allows me to quickly ignore any kind of, "well when was this?" or "did that actually happen?", type questioning."

…"I want a note. I want a note before I excuse an exam, excuse a quiz, excuse a paper"

Furthermore, while students will inevitably receive their documentation from varying healthcare providers, instructors expressed their preference to receive documentation from a university-affiliated entity (e.g. campus health center, disability student services, etc.).

No Note Provided. If a student was unable to produce medical verification of their injury, instructors were forced to lean on a multitude of factors as they rationalized the decision to either provide, or withhold, accommodations. These factors included a) class size (small vs. large), b) student classification (graduate vs. undergraduate), and c) instructor's empathy. Individually, these factors had a positive or negative implication over an instructor's choice. For example, instructor comments on class size indicate that smaller classes are of benefit:

…"The smaller number makes a little bit more of an intimate setting, and you get to know people as individuals. And more importantly, you get to know personalities"

…"If the question is, do you think class size effected my ability to effectively respond to the concussion situation? It's a yes"

Instructors also voiced an inclination to trust graduate students over undergraduates. For instance:

…"To be very honest with you, and not to sound disparaging towards undergraduates, but I talked to my colleagues who teach undergraduates, and we were all undergraduates at one time. But undergraduates don't come to class sometimes, they're not a serious in their scholarship. So sometimes, I think instructors have to be a little bit more rigid with undergraduates. With a graduate student, they're semi-professionals in a sense, so they trust them"

…"She had offered to bring a doctor's note, but I said that it wasn't necessary. It's a graduate level course, so I go with the fact that they're grad students, and if they're lying, then it's beyond what I care to get into"

Lastly, intrinsic predispositions like empathy appeared to significantly impact an instructor's approach when managing a student with concussion.

…"I tend to be the over-trusting one [instructor]. I rarely find that a student will put something that important [injury] on the table and be lying about it. It's kind of the way I like to approach life. I just think it's a better way to live"

…"I love them. I do, I love my students. They're little people, they're far from home. I think they're stressed with being at this huge university and figuring it all out. And so I don't need to be one of their problems"

The opposing factors described here swayed instructor responses to various degrees. In turn, Figure 1. gives a visual interpretation of how each of these psychosocial variables foreseeably dictated an instructor's decision making.

Accommodating the Student

This final theme encompasses the instructor's approach to assisting a student recovering from concussion. This theme signifies that the student's injury has been

legitimized, via documentation or other psychosocial factors, and speaks to the duties in which instructor's feel responsible for executing, in addition to the feasibility of accommodation requests. Heavily inspired by the interview card sorting activities, the subthemes include a) instructor's role, and b) feasibility of the accommodation.

Instructor's Role. Card sorting activity 1 asked instructors to determine the members of a collegiate RTL team. Under the first criteria, 70% of instructors believed they were currently part of a RTL team. When asked to explain why they were not part of the team, the remaining 30% reported:

…"I've never been asked to be part of a return-to-learn team for injured students"

Under the second criteria, 95% of instructors believed that they should be part of a collegiate RTL team. Given this high percentage of self-inclusion, the follow-up question was asked, *"what role do you believe you should have on the team?"*. The responses were consistent:

…"Supportive. To help that student do as well as he/she can until they become a rehabilitated student"

…"To help that student become successful in my class despite the diagnosis of concussion"

…"My role is to receive input from other [team] members, and then to discuss with students, what are your goals? Do you want to wait a couple weeks? Do you want to try to fight through this? What are your goals, and how can I help you to achieve those?"

Instructors also consistently excluded three individuals from the RTL team, regardless of sorting criteria: parent, campus police, and coach. Instructors noted:

…"FERPA prevents me from having any conversations with parents"

…"Simply, campus police has nothing to do with Return to Learn…Coaches, they should have no authority over that"

Lastly, when asked to identify the most important member of the team, instructors were equally split between three members: medical provider, disability student services, and the student.

Feasibility of the Accommodation. The results from card sorting activity 2 are shown in Table 2. Across the sample's entirety, instructors perceived "wearing sunglasses" and "excused from exams" as the most and least feasible requests, respectively. When broken into quartiles, the most feasible requests (wear sunglasses in class, additional time on assignments, additional time on exams) represent academic adjustments, whereas the least feasible requests (decreased workload, excused from assignments, excused from tests) are classified as academic accommodations. Once these trends were identified, instructors were subsequently asked, *"what makes these requests less feasible, and these more feasible?"*. Regarding the least feasible requests, instructors responded:

…"We need to have demonstration of knowledge, which would come from assignments and tests, to be confident that this student is moving along an academic pathway and truly learning"

…"I need to know that they [students] know the material before they leave my class"

Regarding the most feasible requests, instructors responded:

…"I'm going to say this. These [pointing to the less feasible cards] are extra work for me"

…"*The question of whether a person cares about a student [to accommodate them] is secondary to, do I, or don't I have time to deal with this*"

The introduction of time as a constraint to helping a student by NTT instructors was an insightful addition to this subtheme. Upon further probing, we discovered that an instructor's rank may restrict their availability. Several NTT instructors commented on the suspected hardships they believed their TT colleagues would experience. One NTT instructor nicely summarized:

…"*At an R1 institution, understand what's driving the bus. Research, publications. The teaching is important, but I think the research and the publications are more important. So you know, there are probably some individuals who think, "I'm teaching this class because I have to, but this [research] is really where I'm going to invest my time", and now I have to deal with a student in my class who has this condition that we don't know how or when it's going to resolve. And I have to deal with that when I'd rather be chasing a grant or writing a scholarly paper. So I could see where dealing with concussions are problematic for some in the academic setting*"

A second instructor added:

…"*Someone has a hundred things to do, they have time to do 10 of them, and now a student [with concussion] says "hey, can you meet?". And for a lecturer who's all about students and doesn't have this other research, says "sure you can come into my office and take this test that you missed". For a PhD [tenure-track] it's, I don't even know where to fit this in. It's a second priority of a second priority*"

To explore if these claims held merit, we asked tenure-track instructors the following question, *"is there anything about being tenure track, or your job description and duties,*

that you think would impede you from assisting a student with a concussion?"

Responses included:

…"I don't think so. Not that comes to mind. I do compress my teaching into a very narrow window, so that I can focus on my research the bulk of my time during the year... I tend to take my teaching very seriously, and when I think about how students are paying to be in the classroom and the investment they're making, I view it as my job and moral responsibility to bring as much as I can to that context. And so my attitude toward compressing it is, yeah, my research is going to slow down a little bit during this period, of time, and that's something I've prepared for"

…"No, not that I can think of"

While only two TT instructors were asked this question during their interview, the remaining TT participants were followed up with via email to offer their input; however, no others replied.

Table 2. Accommodation Feasibility Rank Order

Adjustment / Accommodation	Average Value			
	Total Sample	Non Tenure-Track	Tenure-Track	Difference (Non Tenure vs Tenure)
additional time on assignments	1.1	1.2	1.0	0.2
additional time on exams	1.2	1.2	1.2	0.0
audio lectures	1.5	1.6	1.4	0.2
decreased workload	1.7	1.7	1.8	0.1
ear plugs	1.4	1.4	1.3	0.1
excused absence from class	1.2	1.3	1.0	0.3
excused from tests	2.4	2.4	2.3	0.1
excused from assignments	2.0	1.9	2.0	0.1
headphones	1.4	1.3	1.4	0.1
leave class early	1.3	1.4	1.1	0.3
limited computer work	1.5	1.7	1.2	0.5
paper notes	1.2	1.2	1.3	0.1
reducing screen brightness	1.7	1.7	1.7	0.0
rest breaks	1.2	1.3	1.1	0.2
taking tests in a quiet room	1.2	1.2	1.2	0.0

wear sunglasses in class	1.0	1.0	1.0	0.0

Average rank values of adjustments / accommodations reference a 1-3 scale, with a value closer to 1.0 representing a very feasible accommodation, and a value closer to 3.0 representing an accommodation that is not feasible at all.

DISCUSSION

This study is the first to gather an in-depth perspective of how collegiate instructors perceive and manage concussion in their classrooms. While each of the discovered themes independently represent an important aspect of concussion management, they collectively embody the landscape instructors must navigate as they attempt to support their students. Because this study offers the genesis of themes pertinent to collegiate RTL, our discussion will not inspire deductive reasoning or conclusions from the data. Instead, grounded theory allows us to insightfully discuss the implications of our data, and guide the aims of subsequent investigations with a higher degree of accuracy.

Awareness

Previous studies have expressed the importance of educating RTL team members about concussion in an effort to improve patient outcomes;[3,12,30] however, concussion awareness (external knowledge, previous experience) did not appear to influence our sample's consistent response to concussion management in the classroom. This contrasts previous research which indicates that knowledge discrepancies exist between academic disciplines. Specifically, business faculty and staff in a collegiate setting have exhibited significantly less knowledge and awareness of concussion versus health science and humanity disciplines.[12] Identifying this contradiction prompted us to question why our sample displayed a homogeneous understanding of concussion. One possible explanation can be offered by Mokris et al.[12], who indicated that awareness of concussion is significantly higher in collegiate faculty that have previously provided

accommodations to students with concussion, versus those who have not. Given that our inclusion criteria required previous experience with concussion in the classroom, we can corroborate Mokris' findings, and begin to understand the origin of our cohort's uniform voice towards concussion.

Despite an instructor's perceived knowledge of concussion, nearly all expressed a desire to receive medical documentation from students. The exception to this pattern was seen in instructors who conveyed an empathetic position towards their student's hardships. In fact, empathy appeared to greatly influence an instructor's decision to award accommodations even in the absence of such documentation (Figure 1.). Human behavior research would indicate that this trend was not simply a coincidence, as both sex and age have been identified as significant predictors of altruistic decision making; with older individuals and females revealing greater altruistic tendencies.[31] More importantly, altruistic decision making is significantly mediated by emotional empathy, instead of reasoning.[31] This supports two of our findings. First, it offers insight as to why instructors still desired medical documentation from students despite their knowledge of concussion or its effect on classroom activities. Second, it helps explain why an empathetic instructor provides students with a greater chance of receiving classroom accommodations when medical verification is absent. Contrary to previous research,[32] these findings collectively require us to question whether targeted concussion education is the most effective method for establishing uniform decision making from instructors. In fact, previous research buttresses this statement as Glang et al. reports how an online concussion course can significantly increase knowledge of concussion in general education teachers, but fails to instill long term (6 month) application of this knowledge

(p = 0.92).[33] This evidence suggests that concussion education does not lead to significant changes in classroom management of concussion, which in the context of our findings, would still leave instructors requesting medical documentation for legitimacy and guidance. We should note, however, that while concussion education may yet play a supportive role within collegiate RTL, perhaps access to medical care and diagnosis would yield greater uniformity of outcomes.

Researchers should also consider the unknown perspectives of instructors who have no exposure to concussion, no experience with it in the classroom, or both. Do these instructors display a different outlook towards concussion and its accommodation in the classroom? Also, if empathy truly effects instructor decision making, and is not significantly mediated by concussion awareness, then instructors who did not meet our inclusion criteria could theoretically exhibit similar decision making profiles as our sample. Future investigations should be mindful of these possibilities.

Legitimacy

Perhaps the most robust and consistent pattern to arise from this study was an instructor's desire to legitimize a student's request for accommodations. While instructors sought out expert opinion as a confirmation of disability, there were those who also highlighted the need to keep supportive opportunities fair and equally available within the class. Post-concussion accommodations often include privileges like extended time to complete assignments, however, allowing these requests for only one student prompts an instructor to seek a valid reason for doing so. Medical documentation will not only confirm a need for assistance, but will also maintain the status of a fair classroom environment. Interestingly, nearly all instructors expressed a

desire to receive medical documentation, however, no one addressed the possible struggles of obtaining such documents.

Requiring a student to receive medical care prior to granting accommodations not only ensures that the health of the student is under proper medical supervision, but it also imposes a financial burden upon them. In fact, this burden may be more tangible than expected, as nationwide survey data indicates that nearly 60% of colleges (150 public from 42 states and 133 private from 32 states) have concerns about under-insured students attending their institutions; as dictated by a student having ≥ $1,000 deductible plan.[34] To complicate matters further, some institutions do not offer health insurance plans to their students, or do not require students to carry health insurance while enrolled.[35-37] Of greater concern, however, is that disability service offices at select universities have clearly recognized concussion as a covered disability[38-40], while others have remained ambiguous in their scope[41-43]. Impressionably, this conveys the notion that students at certain institutions may not receive accommodations for their concussion. This is particularly troubling, considering that recent amendments to the Americans with Disabilities Act (ADA) marked the inclusion of traumatic brain injury as a recognized disability by the federal government, mandating that faculty provide accommodations when official documentation is endorsed by the institutions disability services office.[44] What's more, the ADA suspended its "transitory" regulation tied to disability criteria (i.e. < 6 months).[44] This means that individuals suffering from mild forms of brain trauma (i.e. concussions), despite its temporary nature, can still receive disability assistance. These amendments are the first ever to provide college students with guaranteed classroom accommodation following concussion; however, qualifying

for these services requires presentation of medical documentation outlining the disability, which to our previous point, may be a significant barrier for students to overcome. Furthermore, it should be clarified that a note from a qualified medical provider, while significant, is not the equivalent to an endorsed document from a school's disability services office; given that the former is a medical opinion, and the latter is a federally-backed call-to-action. Our participants, however, perceived both equally, which bodes well for students.

Until concussion injury is ubiquitously legitimized for college students, we must continue to wrestle with the intricate decision making that instructors undergo in the absence of medical documentation. As seen in Figure 1., the logistical and psychosocial characteristics of an instructor and their classroom can dictate the acquisition of concussion assistance. For instance, instructor responses seemed to tether a disadvantaged position to larger classes and undergraduate students (Figure 1.). Pragmatically, a large lecture hall does not afford an instructor the opportunity to gain an interpersonal connection with many of their students, and therefore could hinder an instructor's ability to view requests from those students as impartial or truthful. This was supported by the opinion that undergraduate students are *"not as serious in their scholarship"*. In contrast, teacher-student interactions within smaller classes were portrayed as *"intimate"* and *"personable"*, allowing instructors to learn about their students as individuals. Divergence between how instructors referenced large and small classes lends us valuable insight as to how concussion symptomology may be interpreted in each of these settings. To explain, concussion injuries are often accompanied by psychological symptom profiles (irritability, anxiety, sadness, etc.)

which are not always outwardly recognizable. In turn, having a pre-injury "baseline" of a student's behavior and tendencies within the classroom could not only alert an instructor as to any deviations from the student's norm, but also be used as evidence to support a student's undocumented claim of having a concussion. In addition to smaller classes, instructors also suggested that trust was implicitly given to graduate level students, given their assumed professional status. While this benefits students pursuing post-graduate studies, these students are typically not the majority enrolled at an institution, therefore leaving the larger student population in jeopardy. The overall uncertainty of how an instructor will internally rationalize a student's request for help is a predicament we refer to as "teacher roulette", which was hinted at by one instructor:

…*"You're [the student] kind of at their [the instructor] mercy. It's like, "oh, I got one that's accommodating….I hold the keys to all the gates, and the students know it"*

Classroom elements like size or graduate students pose an interesting, and perhaps biased, line of thought from instructors. Future investigations should cautiously explore and add clarity to these initial patterns. Moreover, the experiences of previously concussed undergraduate and graduate students should be gathered to see if their first-hand experiences substantiate the potential inequities identified here.

Accommodating the Student

An instructor's ability to help a student with concussion is seemingly corralled by what they believe their role to be, in addition to the feasibility of what is being requested of them. Consistently, our instructors believed that their role within a RTL team should be peripheral and responsive. This triangulates their desire to receive confirmation of injury from medical personnel. Additionally, no instructor identified themselves as the most

important member of the RTL team, reaffirming their position as a peripheral contributor. It should be noted, however, that the external stance of an instructor is not indicative of lessened importance. Instead, it is perhaps drawing attention to the view that concussion is first and foremost a medical issue, and while academic faculty and staff play a pivotal role in the seamless re-integration of academic tasks, the course of treatment should be directly supervised and adjusted by medically trained personnel. The rank order (Table 2.) of academic supports stratified which requests may face pushback by an instructor. Triangulation of this data to instructor responses allowed us to detect a temporal undertone associated with an accommodation's feasibility. Therefore, we hypothesize that instructor's views of feasibility stem from a balance between the work required to implement an academic support, and the time needed to do so. To explain, the academic supports that were scored as very feasible (wear sunglasses in class, additional time on assignments, additional time on exams) all possess a "hands off" quality, requiring no additional demand on the instructor. In contrast, somewhat feasible accommodations (audio lectures, limited computer work) may require instructors to create alternative assignments or separate audio recordings of their lectures. Therefore, it can be speculated that the implementation of an adjustment or accommodation by an instructor is inversely correlated to its time commitment. This correlation, however, does not appear to be the chief influence for the scoring of our least feasible accommodations (decreased workload, excused from assignments, excused from tests). Instead, instructor responses suggest that maintaining course integrity is the driving factor. Curriculums, particularly those within accredited programs, set forth a course of instruction designed to ensure that students

have acquired a specific level of skill and knowledge prior to degree maturation. In turn, instructors likely feel responsible to safeguard the standards of their respective departments by upholding the integrity and rigor of their individual courses. Additionally, courses within a curriculum are routinely arranged in a manner that requires a student to display pre-requisite knowledge prior to advancing to the subsequent course. Therefore, a student forgoing an entire exam/assignment would contradict this principle. It should be noted, that while excusing exams/assignments were labeled as unacceptable, all instructors reported that they would be willing to postpone these items until the student had recovered.

LIMITATIONS

The present study is not free of limitations. First, this study was conducted at a large, public institution; therefore, faculty at other colleges and universities (e.g. smaller, private, etc.) may possess idiosyncratic perspectives unique to their setting. Second, while adjunct instructors were eligible to participate, none volunteered, which necessitates their opinions be gathered as data indicates that nearly 50% of the faculty positions at degree granting institutions are adjunct or part-time.[45] Third, our cohort included five academic disciplines, however, 65% belonged to a college of Public Health, requiring future works to achieve more even representation. Lastly, because certain health disparities are the result of race and ethnicity, it is possible that an instructor's perspective towards injury and illness is influenced by their background. Because the studied university is comprised of only 20% minority faculty,[46] ethnic and racial heterogeneity must be a chief component of follow-up inquiry.

CONCLUSION

This is the first study to outline RTL management in the collegiate setting. Of primary importance, the themes generated here not only illustrate the foundational characteristics of collegiate RTL, but also provide a platform for future collegiate RTL research to build from. Medical verification of concussion has emerged as a significant theme within the college setting, and when absent, renders students open to the unpredictable rationale of their instructors. The impact of concussion education efforts on collegiate faculty is also under question, as the various levels of concussion awareness among instructors did not appear to alter their inclination to legitimize a student's claims. Instructors also wished to receive medical guidance as peripheral members of the RTL team, and may be reluctant to implement accommodations that infringe upon the integrity of their course, or require significant time commitments. The presented findings, while not universally transferable, are meant to represent a credible, transparent, and robust depiction of our cohort's voice regarding the management of concussion within the classroom.

Acknowledgements: The authors acknowledge the support of the 23 instructors who voluntarily participated in this research.

Author Contributions: ZWB designed the research idea. DJC, DMK, TFL, and KK refined the study protocol and study implementation. DJR acted as the second coder of the data. All the authors contributed to the writing and editing of the manuscript.

Funding statement: This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests: The authors have no competing interests to disclose.

Ethics approval: Ethics approval to conduct this research was received from X University Institutional Review Board, and given exempt status.

Data statement: Technical appendix, statistical code, and dataset available from the Dryad repository, DOI: [include DOI for dataset here].

Figure Caption: Figure 1. No Note Provided: Factors Influencing an Instructor's Decision to Allow Accommodations.

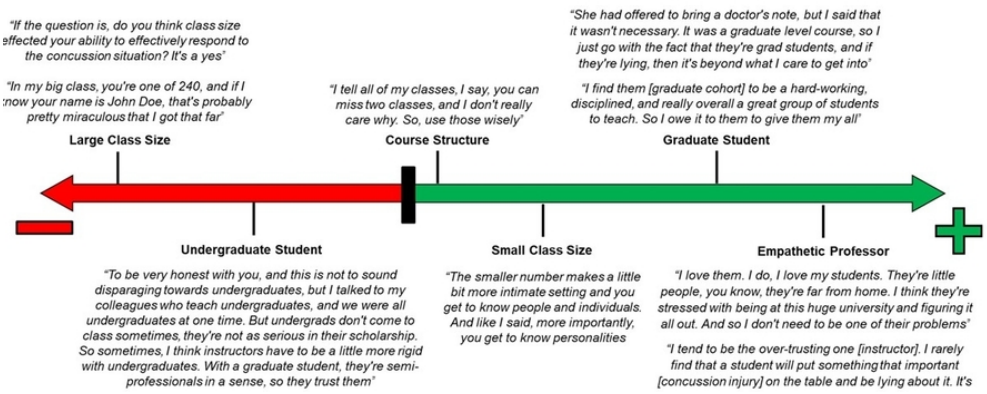
REFERENCES

1. McCrory P, Meeuwisse W, Dvorak J, et al. Consensus statement on concussion in sport-the 5(th) international conference on concussion in sport held in Berlin, October 2016. *Br J Sports Med.* 2017;51(11):838-847.
2. DeMatteo CA, Randall S, Lin CA, Claridge EA. What Comes First: Return to School or Return to Activity for Youth After Concussion? Maybe We Don't Have to Choose. *Front Neurol.* 2019;10:792.
3. Purcell LK, Davis GA, Gioia GA. What factors must be considered in 'return to school' following concussion and what strategies or accommodations should be followed? A systematic review. *Br J Sports Med.* 2019;53(4):250.
4. Corwin DJ, Wiebe DJ, Zonfrillo MR, et al. Vestibular Deficits following Youth Concussion. *J Pediatr.* 2015;166(5):1221-1225.
5. Purcell L, Harvey J, Seabrook JA. Patterns of Recovery Following Sport-Related Concussion in Children and Adolescents. *Clin Pediatr (Phila).* 2016;55(5):452-458.
6. Ransom DM, Burns AR, Youngstrom EA, Vaughan CG, Sady MD, Gioia GA. Applying an Evidence-Based Assessment Model to Identify Students at Risk for Perceived Academic Problems following Concussion. *J Int Neuropsychol Soc.* 2016;22(10):1038-1049.
7. Ransom DM, Vaughan CG, Pratson L, Sady MD, McGill CA, Gioia GA. Academic effects of concussion in children and adolescents. *Pediatrics.* 2015;135(6):1043-1050.
8. Brown NJ, Mannix RC, O'Brien MJ, Gostine D, Collins MW, Meehan WP, 3rd. Effect of cognitive activity level on duration of post-concussion symptoms. *Pediatrics.* 2014;133(2):e299-304.
9. Darling SR, Leddy JJ, Baker JG, et al. Evaluation of the Zurich Guidelines and exercise testing for return to play in adolescents following concussion. *Clin J Sport Med.* 2014;24(2):128-133.
10. Makki AY, Leddy J, Hinds A, et al. School Attendance and Symptoms in Adolescents After Sport-Related Concussion. *Glob Pediatr Health.* 2016;3:2333794x16630493.
11. Lovell MR, Collins MW, Iverson GL, et al. Recovery from mild concussion in high school athletes. *J Neurosurg.* 2003;98(2):296-301.
12. Mokris R, Kessler, A, Williams, K, Ranney, J, Webster, J, Stauffer, K. Assessing concussion knowledge and awareness in faculty and staff in a collegiate setting. *Journal of Concussion.* 2019;Volume 3: 1–11.
13. Bevilacqua ZW, Kerby ME, Fletcher D, et al. Preliminary evidence-based recommendations for return to learn: a novel pilot study tracking concussed college students. *Concussion.* 2019;4(2):Cnc63.
14. Runyon LM, Welch Bacon CE, Neil ER, Eberman LE. Understanding the Athletic Trainer's Role in the Return-to-Learn Process at National Collegiate Athletic Association Division II and III Institutions. *J Athl Train.* 2020.
15. Statistics NCfE. Nontraditional Undergraduates. In: Education USDo, ed2013.

16. Arnett JJ. Emerging adulthood. A theory of development from the late teens through the twenties. *Am Psychol.* 2000;55(5):469-480.
17. Corwin DJ, Zonfrillo MR, Master CL, et al. Characteristics of prolonged concussion recovery in a pediatric subspecialty referral population. *J Pediatr.* 2014;165(6):1207-1215.
18. Rosenbaum PE, Locandro C, Chrisman SPD, et al. Characteristics of Pediatric Mild Traumatic Brain Injury and Recovery in a Concussion Clinic Population. *JAMA Netw Open.* 2020;3(11):e2021463.
19. Black AE, Deci EL. The effects of instructors' autonomy support and students' autonomous motivation on learning organic chemistry: A self-determination theory perspective. *Science Education.* 2000;84(6):740-756.
20. Richmond AS, Berglund MB, Epelbaum VB, Klein EM. a + (b1) Professor–Student Rapport + (b2) Humor + (b3) Student Engagement = (Ŷ) Student Ratings of Instructors. *Teaching of Psychology.* 2015;42(2):119-125.
21. Rogers DT. Further Validation of the Learning Alliance Inventory:The Roles of Working Alliance, Rapport, and Immediacy in Student Learning. *Teaching of Psychology.* 2015;42(1):19-25.
22. Ryan RG, Wilson JH, Pugh JL. Psychometric Characteristics of the Professor–Student Rapport Scale. *Teaching of Psychology.* 2011;38(3):135-141.
23. Sheldon KM, Krieger LS. Understanding the Negative Effects of Legal Education on Law Students: A Longitudinal Test of Self-Determination Theory. *Personality and Social Psychology Bulletin.* 2007;33(6):883-897.
24. Wilson JH, Ryan RG. Professor–Student Rapport Scale:Six Items Predict Student Outcomes. *Teaching of Psychology.* 2013;40(2):130-133.
25. Benson T, Cohen, AL, Buskist, W Rapport: Its relation to student attitudes and behaviors toward teachers and classes *TEACHING OF PSYCHOLOGY* 2005;32 (4):237-239
26. Demir M, Burton S, Dunbar N. Professor–Student Rapport and Perceived Autonomy Support as Predictors of Course and Student Outcomes. *Teaching of Psychology.* 2019;46(1):22-33.
27. Tisdell Ma. *Qualitative research : a guide to design and implementation.* Wiley; 2016.
28. Strauss Ca. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory.* 2nd ed: Sage Publications; 1998.
29. Lincoln YG, E. *Naturalistic Inquiry* Sage Publications; 1985.
30. Sarmiento K, Donnell Z, Bell E, Hoffman R. From the CDC: A qualitative study of middle and high school professionals' experiences and views on concussion: Identifying opportunities to support the return to school process. *J Safety Res.* 2019;68:223-229.
31. Rosen JB, Brand M, Kalbe E. Empathy Mediates the Effects of Age and Sex on Altruistic Moral Decision Making. *Front Behav Neurosci.* 2016;10:67.
32. Finn C. Effects of a faculty training program on knowledge and awareness of student concussion and academic performance. *J Am Coll Health.* 2020:1-8.
33. Glang AE, McCart M, Slocumb J, et al. Preliminary Efficacy of Online Traumatic Brain Injury Professional Development for Educators: An Exploratory Randomized Clinical Trial. *J Head Trauma Rehabil.* 2019;34(2):77-86.

34. Association ACH. *Student Health Insurance/Benefit Plans: Adapting to the Environment Post Affordable Care.* 2014.
35. Alabama Uo. Insurance Information. Student Health Center and Pharmacy https://shc.sa.ua.edu/billing/insurance-information/. Accessed 7/21/2020.
36. Michigan Uo. Health Services and Insurance Educational and Support Services. https://www.law.umich.edu/currentstudents/studentservices/handbook/edusupsvcs/Pages/UniversityHealthServices.aspx. Accessed 7/21/20.
37. University TAM. Health Insurance. Student Health Services. https://shs.tamu.edu/insurance/. Accessed 7/21/20.
38. Oregon Uo. What is Disability? Accessible Education Center. https://aec.uoregon.edu/content/what-disability. Accessed 7/21/20.
39. Vermont Uo. Documentation Guidelines Center for Academic Success. https://www.uvm.edu/academicsuccess/documentation-guidelines. Accessed 7/21/20.
40. Michigan Uo. Acquired/Traumatic Brain Injury. Services for Students with Disabilities. https://ssd.umich.edu/article/acquiredtraumatic-brain-injury-abitbi. Accessed 7/21/20.
41. College V. Disability Accommodations and Support Services Policy. Accessibility and Educational Opportunity. https://accessibilityandeducationalopportunity.vassar.edu/Students/disability-guidelines/. Accessed 7/21/20.
42. Georgia Uo. Temporary Impairments Disability Resource Center. https://drc.uga.edu/site/content_page/temporary-impairments. Accessed 7/21/20.
43. University FS. Documentation Guidelines. Department of Student Support and Transitions. https://dsst.fsu.edu/oas/students/applying-for-services/documentation-guidelines. Accessed 7/21/20.
44. Division UDoJCR. *Final Rule Implementing the ADA Amendments Act of 2008.* 2016.
45. Statistics NCfE. Number of instructional faculty in degree-granting institutions, by employment status, sex, control, and level of institution: Selected years, fall 1970 through fall 2011. In.
46. Bloomington IU. *Full-time Faculty and Staff Headcount by Race and Ethnicity.* 2019.

Figure 1. No Note Provided: Factors Influencing an Instructor's Decision to Allow Accommodations



76x33mm (300 x 300 DPI)

APPENDIX A

Opening questions

1. Tell me how long you've been working at your current institution, and what you teach?

2. Where have you heard the term concussion before?
    a. From those sources, what exactly did you learn about concussion?

Investigative Questions

3. You reported that you've had at least one concussed student in your class. Can you tell me more about that experience?

    a. Your experience sounded ___ . Would you say educators need something more in order to better help concussed students? Or do you think the current process is working well?
        i. IF guidelines are mentioned, or MD directions are mentioned, then ask this probe
            1. Do you think it is within a teacher's expertise to be making decisions of academic participation for a concussed student?
        ii. Did you know what their needs were?
        iii. Did you feel prepared to handle that student's needs?
            1. Yes: what would you say prepared you?
            2. No: what type of preparation would you say is missing

4. Here are some cards with different academic adjustments and accommodations written on them. I'd like you to place each of these cards in one of the three piles here based on how feasible you believe these are to implement in your school and classroom. (Piles: not feasible at all, somewhat feasible, absolutely feasible)

    a. Overall, what accommodation/adjustment are teachers in your discipline most likely to implement? Least likely to implement?

5. Currently, 9 states observe legislation which mandates high schools to have protocols for gradually returning students with concussion back into the classroom setting. Do you think this type of policy-making should make its way into the collegiate setting?

    a. So you believe these policies should be in collegiate education. What would you say is the first step in making something like this happen?
    b. So you believe college educators should not be responsible for this. What thoughts comprise that statement?

6. Here is an example of an medical note (appendix G) for a concussed student that a teacher might receive. Please take your time to read over it, and tell me what aspects of this note you like, don't like, find helpful, and then we'll discuss your impressions?

    a. What do you find helpful about this note?
    b. What would you say is missing that you would like to receive from a note
    c. Here is another note that an educator might receive (appendix Hf). Do you find this version more/less helpful, and why?
    d. Has a medical professional ever directly reached out to you about a student's concussion?
        i. Who have you spoken with? What was said?

7. Return to learn is a phrase that describes the process of re-integrating a student with concussion back into the classroom after a head injury. Here are some cards with different individuals written on them. I'd like you to place all the individuals you believe to currently be part of the RTL team in this pile labeled "RTL Team", and those who aren't in this pile labeled "Non-member"

    a. I see that you placed "the student's teacher" in the "RTL Team" pile. why is that? What role do you feel you as a teacher have?
    OR
    b. I see that you *did not* place "the student's teacher" in the "RTL Team" pile, why is that? Why do you feel teachers are excluded?
        i. Either case = do you think teachers should play a more central role on the team? Why?
    c. This is who you currently believe to be part of the RTL team. I'd like you to now arrange these individuals based on who you believe should be part of the team, and who shouldn't

8. Are there any key points we haven't talked about that you fell are important for teachers, medical providers, and for me to know?

APPENDIX A *(amended 2/9/20)*

Opening Questions

1. Tell me how long you've been working at your current institution, and what you teach?

2. When I say the term concussion, what comes to mind?
    a. From those sources, what exactly did you learn about concussion?

Investigative Questions

3. You reported that you've had at least one concussed student in your class. Can you tell me more about that experience? How did you hear? Who did you communicate with? Etc.
4. Here are some cards with different academic adjustments and accommodations written on them. I'd like you to place each of these cards in one of the three piles here based on how feasible you believe these are to implement in your school and classroom. (Piles: not feasible at all, somewhat feasible, very feasible)

    a. Would you change any of your answers if the class size were big? Small?

5. Here is an example of a medical note (appendix G) for a concussed student that a teacher might receive. Please take your time to read over it, and tell me what aspects of this note you like, don't like, find helpful, and then we'll discuss your impressions?

    a. What do you find helpful about this note?
    b. What would you say is missing that you would like to receive from a note
    c. Here is another note that an educator might receive (appendix H). Do you find this version more/less helpful, and why?
    d. Because this note is from DSS, does that hold any significance to you?
6. Return to learn is a phrase that describes the process of re-integrating a student with concussion back into the classroom after a head injury. Here are some cards with different individuals written on them. I'd like you to first place all the individuals you believe to currently be part of the RTL team in this pile labeled "RTL Team", and those who aren't in this pile labeled "Not RTL". Then I'd like you to arrange these individuals based on who you believe should be part of the team, and who shouldn't.

    a. I see that you did/did not place "teacher/professor" in the "RTL Team" pile. Why is that? What role do you feel you as a teacher have?
    b. Who is the most important person on the team, or point person?

7. Why do you feel as though you're as accommodating as you are? Is it because you've received a medical note? Is it who the note comes from? Is it something you believe you should do? Is it something you believe is required of you?

8. Are there any key points we haven't talked about that you fell are important for teachers, medical providers, and for me to know

APPENDIX B

* Each row will be its own separate index card, and will be given to the participant collectively to sort

Medical Doctor / Diagnosing Medical Provider

Athletic Trainer

Student's Coach

Counseling and Psychological Services

Student's Academic Advisor

Campus Disability Services

Professor

Campus Police

Parent/Guardian

Student

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

No. Item	Guide questions/description
Domain 1: Research team and reflexivity	
Personal Characteristics	
1. Interviewer/facilitator	ZWB conducted the interviews
2. Credentials	Ph.D., ATC
3. Occupation	University Educator
4. Gender	Male
5. Experience and training	Researcher was trained in college pedagogy, qualitative methods and analysis, and has an expertise in clinical Neurotrauma.
Relationship with participants	
6. Relationship established	No
7. Participant knowledge of the interviewer	Participants only knew that this research was being conducted to gather their perspectives on concussion management in the classroom.
8. Interviewer characteristics	No bias was reported about either coder, nor the interviewer
Domain 2: study design	
Theoretical framework	
9. Methodological orientation and theory	Grounded theory
Participant selection	
10. Sampling	Purposive (pg 5)
11. Method of approach	Email (pg 5)
12. Sample size	23 (pg 5)
13. Non-participation	84 people either did not meet inclusion criteria, or declined
Setting	
14. Setting of data collection	University campus (pg 5)
15. Presence of non-participants	No
16. Description of sample	12 males (11 White, 1 Latino) and 11 females (10 White, 1 Latino), 14 non-tenure track and 9 tenure-track educators (pg 6)
Data collection	
17. Interview guide	Created by the authors
18. Repeat interviews	No (pg 6)
19. Audio/visual recording	Yes, audio recordings (pg 6)
20. Field notes	Interviewer took notes during the interview as appropriate
21. Duration	Average 62 minutes (pg 6)
22. Data saturation	Yes, data saturation was reached
23. Transcripts returned	Yes (pg 9)
Domain 3: analysis and findings	
Data analysis	
24. Number of data coders	2 (pg 8)
25. Description of the coding tree	No
26. Derivation of themes	Derived from the data (pg 8)
27. Software	Microsoft Word (pg 8)
28. Participant checking	No
Reporting	
29. Quotations presented	Yes, but are de-identified
30. Data and findings consistent	Yes

31. Clarity of major themes	Yes
32. Clarity of minor themes	Yes