THE STATE OF THE ART IN STUDENT ENGAGEMENT

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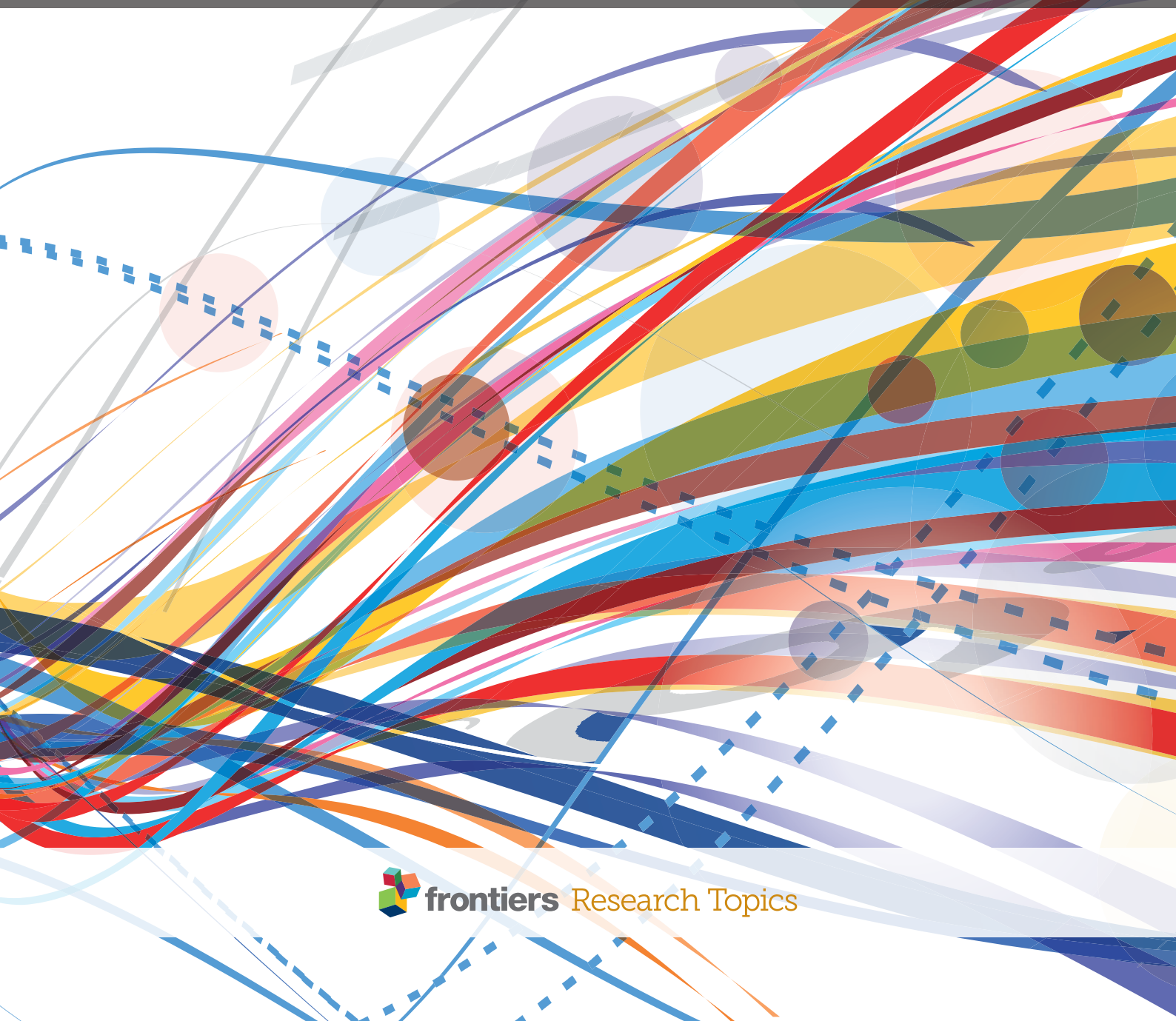

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THE STATE OF THE ART IN STUDENT ENGAGEMENT

Topic Editors:
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There is an extensive literature conducted from a range of theoretical perspectives and methodologies on the role of groups and student learning. However here the concept of the 'group' is heavily contested at a theoretical level but within higher education practice, characterizing the group has tended to be clear cut. Groups of students are often formed within the parameters of specific educational programs to address explicitly defined learning objectives. These groups are often small scale and achieve tasks through cooperative or collaborative learning. Cooperative learning involves students dividing roles and responsibilities between group members, so learning becomes an independent process and outcome. On the other hand, collaborative learning involves students working together by developing shared meanings and knowledge to solve a task or problem. From this perspective, learning is conceptualized as both a social process and individual outcome. That is, collaborative learning may facilitate individual student conceptual understanding and hence lead to higher academic achievement. The empirical evidence is encouraging as has been shown that students working collaboratively tend to achieve higher grades than students working independently.

However the above perspectives on student engagement assume that groups are formed within the confines of formal learning environments (e.g. lecture theaters), involve students on the same degree program, have the explicit function of achieving a learning task and disband once this has been achieved. However, students may also use existing social networks such as friendship groups as a mechanism for learning, which may occur outside of formal learning environments. There is an extensive literature on the role and benefits of friendship groups on student learning within primary and secondary education but there is a distinct lack of research within higher education.

This ebook is innovative and ambitious and will highlight and consolidate, the current understanding of the role that student based engagement behaviors may serve in effective pedagogy.

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EDITORIAL
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The state of the art in student engagement

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Keywords: student engagement, student learning outcomes (SLOs), relational learning, social behavior, learning technology

There has been a considerable shift in the higher education literature from a focus on the characteristics and traits of individual students to the role of the learning environment. More than ever, the context in which learning takes place has come to the fore and the role of lecturers in helping to facilitate learning and to engage students across a wide diversity of learning contexts is of upmost importance. To this end, learning is relational, which involves the development and quality of relationships between students and lecturers but also the relationships between students themselves (see Gergen, 2011). The empirical evidence is encouraging as it demonstrates that students who learn collaboratively achieve higher grades than students working independently. The challenge for programme managers is to move beyond the prescriptive view that learning only takes place at an individual level within the lecture theater, seminar or tutorial room and explore the wider sets of relationships and communities in which students are situated within (Singh, 2003; Garrison and Vaughan, 2008). Students come to higher education institutions already engaged in a wider set of relationships (e.g., family, employment, and organizations) and will develop new ones through their studies which need to be understood in order to engage students with innovative program design and delivery. This research topic was born out of this need and collects together a range of perspectives that converge on one salient question i.e., by what means can we further engage students in their studies?

This research topic is both innovative and ambitious and highlights as well as consolidates the current understanding of the role that student based engagement behaviors may serve in effective pedagogy. Of the nine papers submitted six were platform articles that highlighted an existing agenda or set a further direction for new lines of work. The very fact that so many opinion articles were submitted to this topic perhaps highlight the need for more empirical work in this area.

In a highly original article, Irving (2015) describes her work on the use of dance to engage students with the development of statistical literacy. Research methods and statistics are traditionally viewed as difficult topics by undergraduate psychology students and many fail to engage due to the (miss) perceived difficulty that they may encounter (Onwuegbuzie and Wilson, 2010). However, by communicating statistical concepts via the medium of dance Irving argues that students can be more readily engaged within this topic. A similar process is advocated with the work of McGivern and Coxon (2015) as well Rich et al. (2014) who respectively describe the possible role that student polling software and student focused assessments have in driving engagement and retention. While Orosz et al. (2015) found that teacher enthusiam drove a reduction of cheating behaviors in subsequent assessments. These articles each highlight the need for student-focused activities in the classroom as facilitators of engagement.

However, such student-focused activities need not be purely designed around the manner in which students engage with their respective programme. Indeed, Senior et al. (2014b) argue that the unique experience of maintaining gainful employment at the same time as studying full time should be considered as a central part of programme design. Not only will this ensure that subsequent programmes are flexible enough to support the real world needs of the incoming student

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cohort but they will also be designed to facilitate effective learning with students who often have to balance the needs of full time study with work and sometimes even family commitments (see also Senior and Cubbidge, 2010). Such student-facing commitments are significant and as Gill et al. (2015) describe sometimes they are simply essential to consider in the delivery of programmes that maximize student retention. While, Senior et al. (2014a) make an interesting observation and bring in organizational theory to highlight the importance of differences in the style of academic leadership and how a more open and relationship focused style of leadership may have a significant benefit in driving student retention.

Taken together these opinion papers describe the importance of various factors that when considered may increase student retention and maximize engagement—these are the gold standards of effective programme design. The work by Hammar-Chiriac (2014), Orosz and colleagues (2015) as well as Senior and Howard (2014) examine the possible social mechanisms that are in play in driving such engagement. Hammer-Chiriac first examines the social processes that are experienced during the act of engaging with group work. In a study that spanned across two institutes involving several programmes and analysis was carried out to examine the student experiences of group work. Three key factors were uncovered to play a significant role in student engagement these being the organization of the group, its effective role in facilitating learning and also its function in the facilitating and an affiliation to a particular discipline based group. Here the students use group work to develop and enforce their emerging professional identity. This goes beyond subscribing to a professional identity merely by enrolling on a particular programme here the act of working together on a group project actively drives the formation of such a professional identity.

The social psychological mechanism behind such a process was examined further in the work by Senior and Howard (2014). In a series of focus group carried out with students who enrolled on Psychology programmes it was revealed that students used their immediate friendship groups not only to reinforce their professional identity but to also reinforce their own understanding of the topics that had been discussed in their lectures. However, perhaps more interestingly was the fact that those student who used their friendship groups to reinforce their understanding of lecture topics were also unaware they were doing so. The authors of this paper highlight the fact that the students were using their engagement within a so called community of learners as an effective learning mechanism but also coined the phrase the "implicit community of learners" to describe the manner in which the students were engaging with their social groups to reinforce their professional identity as well as develop a stronger understanding of the disciplinary concepts.

All of the work described above is a snap shot of the current state of the art in student engagement highlights the various means by which future work can make an impact. We would like to express our sincere thanks to all of the reviewers for the papers submitted to this Research Topic and to Professors Jesus De La Fuentes and Jason Osborne who agreed to act as action editors for the papers that we submitted—without them the work you are currently reading will not have happened.

References

Garrison, R. D., and Vaughan, N. D. (2008). *Blended Learning in Higher Education: Framework, Principles and Guideliness*. San Francisco, CA: John Wiley & Sons.

Gergen, K. J. (2011). *Relational Being: Beyond Self and Community*. New York, NY: Oxford University Press.

Gill, B., Hayes, S., and Senior, C. (2015). The effects of family support and gender on mature student engagement in higher education. *Front. Psychol.* 6:156. doi: 10.3389/fpsyg.2015.00156

Hammar-Chiriac, E. (2014). Group work as an incentive for learning – students' experiences of group work. *Front. Psychol.* 5:558. doi: 10.3389/fpsyg.2014.00558

Irving, L. T. (2015). Teaching statistics using dance and movement. *Front. Psychol.* 6:50. doi: 10.3389/fpsyg.2015.00050

McGivern, P., and Coxon, M. (2015). Student polling software: where cognitive psychology meets educational practice? *Front. Psychol.* 6:55. doi: 10.3389/fpsyg.2015.00055

Onwuegbuzie, A. J., and Wilson, V. A. (2010). Statistics anxiety: nature, etiology, antecedents, effects, and treatments-a comprehensive review of the literature. *Teach. High. Educ.* 8, 195–209. doi: 10.1080/1356251032000052447

Orosz, G., Tóth-Király, I., Bőthe, B., Kusztor, A., Üllei, Z., and Jánvári, M. (2015). Teacher enthusiasm: a potential cure of academic cheating. *Front. Psychol.* 6:318. doi: 10.3389/fpsyg.2015.00318

Rich, J. D. Jr., Colon, A. N., Mines, D., and Jivers, K. L. (2014). Creating learner-centered assessment strategies for promoting greater student retention and class participation. *Front. Psychol.* 5:595. doi: 10.3389/fpsyg.2014.00595

Senior, C., and Cubbidge, R. (2010). Enhancing employability in the "ME generation". *Educ. Train.* 52, 445–449. doi: 10.1108/00400911011068405

Senior, C., and Howard, C. (2014). Learning in friendship groups: developing students' conceptual understanding through social interaction. *Front. Psychol.* 5:1031. doi: 10.3389/fpsyg.2014.01031

Senior, C., Howard, C., and Senior, R. (2014a). The future and the female academic leader: advancing student engagement. *Front. Psychol.* 5:377. doi: 10.3389/fpsyg.2014.00377

Senior, C., Reddy, P., and Senior, R. (2014b). The relationship between student employability and student engagement: working toward a more unified theory. *Front. Psychol.* 5:238. doi: 10.3389/fpsyg.2014.00238

Singh, H. (2003). Building effective blended learning programs. *Educ. Technol.* 43, 51–54.

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OPINION ARTICLE
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The relationship between student employability and student engagement: working toward a more unified theory

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As the field of Psychology evolves there is much interest in understanding how educational practices can be shaped to facilitate the recruitment and engagement of students (Halpern and Hakel, 2010). Highlighting the multiplicity of research approaches within Psychology is one way in which to advance the field. Indeed, in her recent article Rees (2013) argues that the multiplicity of research topics and methodologies is especially important to the discipline and that "promoting and highlighting this should be considered as a potentially effective recruitment strategy" (Rees, 2013 p. 1). Rees argues that the tension in Psychology between the traditional use of scientific method and the inappropriateness of this approach to many of the phenomena of interest create a dialectic that is both an opportunity and a threat. A threat in that such conflict may be off-putting but an opportunity in that methodological pluralism may be a selling point. Rees goes on to support Henriques (2013) in arguing that attempting to unify Psychology around a commitment to research methodology is flawed and that conceptual unification is necessary.

It is Rees's argument that highlighting the unique nature of empirical Psychology is a necessity for student recruitment that is the focus of this paper. Rees suggests that only by highlighting the unique plurality of approaches to our incoming students can we ensure that they become aware of the dialectic that is idiosyncratic to the field of Psychology. By further developing an understanding of this dialectic it is possible that our students will come equipped with a more realistic understanding of what are the unique contributions that Psychology can make to our everyday lives. It is this latter aspect of the Rees model that has great utility and the potential for significant impact on the recruitment, engagement, and subsequent retention of talented undergraduate students. However, such a model only describes one mechanism for student engagement and as such it needs to be developed further before it can contribute to the "unified theory which focuses on providing a conceptual map of the full breadth of psychological enquiry" (Rees, 2013 p. 1). In order to do this one must consider the unique mindset of the students themselves as the central and significant component of the model before we can arrive at such a unified theory.

Nearly all UK undergraduate students are engaged in employment during their studies and consideration of successful employability post graduation is now a key motivator for undergraduates (Blackwell et al., 2001; Bridgstock, 2009). In light of this, by understanding the needs and expectations of the undergraduate student around employability it is possible to develop a more ecologically sound approach to effective student engagement[1]. The importance of successful entry into the graduate job market is a significant extrinsic motivator for undergraduate students (Cassidy and Wright, 2008). Within the UK HE sector alone there has been an almost universal drive to increase employability skills training and nearly all of the major national key performance indicators include a metric on the vibrancy of a graduating cohorts employability health (Wright et al., 2010). Institutes are readily developing a full range of training opportunities that allow students to develop the authentic and transferable skills that would benefit their entry to the job market e.g., from CV writing advice sessions to entire years of an academic programme spent in structured work placements within industry (Fallows and Steven, 2000; Cassidy, 2006). However the constant aspect that is evident across such diverse innovation is the fact that all place the individual student firmly at the center of the learning experience with idiosyncratic and, in some cases, a highly specific, learning experience that is shaped by the students themselves (Lantz and Reddy, 2010). It is the student that in most cases identifies the type of training hat they need or the location of their placement year. By placing the student at the center of this learning process the design of active learning programmes can benefit greatly from a unique insight into the development of a transferable skill-set (Bridges, 1993). Moreover, the importance of such transferable skills would mean that the self directed nature of such study would be more effective than a more traditional didactic delivery (Gureckis and Markant, 2012). In other words by allowing students the opportunity to reflect on their own employment experiences with other students they are more motivated to understand further the competencies that are

[1]It is also worth highlighting the utility of this approach in regards to the various national key performance indicators such the National Student Survey in the UK.

effective in work. In light of the above it would be prudent to expand the Rees model to include the unique experience that the student has in the world of work and to design programmes around such experiences.

When one considers the important transferable skillset that the student develops while experiencing an industry placement etc programme managers should place such a student centered experience at the very heart of the learning process (Reddy and Rochelle, 2008). This could take the form of actual work experience or even the design of assessments that are structured around the application of psychological theory to real life work scenarios. This vital aspect of programme engineering can return great dividends with ensuring students are readily recruited to our programmes and can be achieved with surprisingly little effort in a number of stages that ensures the incoming student is readily engaged within an effective learning role (Van De Ven, 2007).

Does a focus on employability favor vocational degrees? Does this threaten Psychology as a non-vocational degree, and the university tradition which is essentially, in the Newman tradition, non-vocational? A response is to argue for "psychological literacy" (see McGovern et al., 2009; Cranney and Dunn, 2011). In essence it suggests that knowledge of research and theory in psychology, and the full methodological range advocated by Rees would strengthen this, allows students to detect false argument better, and become better citizens and employees. An emphasis on employability and psychological literacy is not necessarily in conflict with traditional values; some influential definitions of employability emphasize such scholarly attributes:

> "Employability is not just about getting a job. Conversely, just because a student is on a vocational course does not mean that somehow employability is automatic. Employability is more than about developing attributes, techniques or experience just to enable a student to get a job, or to progress within a current career. It is about learning and the emphasis is less on "employ" and more on "ability." In essence, the emphasis is on developing critical, reflective abilities, with a view to empowering and enhancing the learner." (Harvey, 2003, cited in Pegg et al., 2012 p. 4 [our bold]).

A further dimension can be added. Barnett (2009) suggests that Higher Education has moved almost by stealth from a focus on knowledge to a focus on skills and competencies. He argues that as we move into a world of further and further complexity neither knowledge nor skills is a secure foundation. He suggests that we need in addition to focus on ontology, on our students' being and becoming. He argues that encounters with disciplinary knowledge through teaching and curricula, such as that in Psychology, support the development of epistemic virtues. A demanding curriculum helps resilience to form; contrasting perspectives help to promote openness; requiring attendance and engagement develops self-discipline; space encourages authenticity and integrity. Teaching that requires students to engage with each other helps to foster respect, generosity and preparedness to listen; explicit standards support carefulness and restraint; encouragement helps to keep students going forward and to be open to new experience; enthusiasm gives new spirit and encourages the will to learn; being required to put forward ones own views helps students to find the courage to stake a claim and to own a position; requiring students to give of selves and be active helps to develop the will to engage.

So—attracting really good students is about the fascination of a subject concerned with what people, think feel and do (not to mention dream, strive for, love and fear). Educating means getting people to be excellent scholars, and translating this into the skills and competencies that employers seek in graduate recruits, helping students to see that psychological literacy and an appreciation of the dialectic in psychology and our methodological pluralism offers valuable ways of seeing and understanding, and helping students to learn from and understand the central importance of being and becoming through study.

By designing academic programmes around the various stages of the learning process described above one can be sure that such programmes are not only effective in delivering a relevant curriculum but one that attracts, engages and retains enthusiastic and talented students to the field. There is no doubt that Rees (2013) should be applauded for initiating the crucial debate as to which factors drive student engagement. Here it is argued that employability training that embeds the student work experience within industry should also be included into this portfolio of effective approaches. The redesign of programmes to includes such strategies may seem complex yet this is the only way to ensure that students are constantly attracted to the degree programmes delivered within universities and then perhaps more importantly remain engaged.

REFERENCES

Barnett, R. (2009). Knowing and becoming in the higher education curriculum. *Stud. High. Educ.* 34, 429–440. doi: 10.1080/03075070902771978

Blackwell, A., Bowes, L., Harvey, L., Hesketh, A., and Knight, P. (2001). Transforming work experience in higher education. *Br. Educ. Res. J.* 27, 269–285. doi: 10.1080/01411920120048304

Bridges, D. (1993). Transferable skills: a philosophical perspective. *Stud. High. Educ.* 18, 43–51. doi: 10.1080/03075079312331382448

Bridgstock, R. (2009). The graduate attributes we've overlooked: enhancing graduate employability through career management skills. *High. Educ. Res. Dev.* 28, 31–44. doi: 10.1080/07294360802444347

Cassidy, S. (2006). Developing employability skills: peer assessment in higher education. *Educ. Train.* 48, 508–517. doi: 10.1108/00400910610705890

Cassidy, T., and Wright, L. (2008). Graduate employment status and health: a longitudinal analysis of the transition from student. *Soc. Psychol. Educ.* 11, 181–191. doi: 10.1007/s11218-007-9043-x

Cranney, J. and Dunn, D. (eds.). (2011). *The Psychologically Literate Citizen*. New York, NY: Oxford University Press. doi: 10.1093/acprof:oso/9780199794942.001.0001

Fallows, S., and Steven, C. (2000). Building employability skills into the higher education curriculum: a university wide initiative. *Educ. Train.* 42, 75–83. doi: 10.1108/00400910010331620

Gureckis, T., and Markant, D. (2012). Self-directed learning: a cognitive and computational perspective. *Perspect. Psychol. Sci.* 7, 464–481. doi: 10.1177/1745691612454304

Halpern, D., and Hakel, M. (2010). Applying the science of learning to the University and beyond: teaching the long-term retention and transfer. *Change Mag. High. Learn.* 35, 36–41. doi: 10.1080/00091380309604109

Harvey, L. (2003). *Transitions from Higher Education to Work: A briefing paper prepared by Lee Harvey (Centre for Research and Evaluation, Sheffield Hallam University), with advice from ESECT and LTSN Generic Centre colleagues*. Available online at: http://bit.ly/oeCgqW

Henriques, G. (2013). Evolving from methodological to conceptual unification. *Rev. Gen. Psychol.* 17, 168–173. doi: 10.1037/a0032929

Lantz, C., and Reddy, P. (2010). Misconceptions and more. *Psychologist* 23, 758–761.

McGovern, T., Corey, L., Cranney, J., Dixon, W., Holmes, J., Kuebli, J., et al. (2009) "Psychologically literate citizens," in *Undergraduate Education in Psychology*, ed D. Halpern (Washington, DC: American Psychological Association), 9–27.

Pegg, A., Waldock, J., Hendy-Isaac, S., and Lawton, R. (2012). *Pedagogy for Employability*. New York, NY: Higher Education Academy.

Reddy, P., and Rochelle, K. (2008). The psychology degree in its place. *Psychol. Teach. Rev.* 14, 46–50.

Rees, C. (2013). Promoting psychology to students: embracing the multiplicity of research foci and method. *Front. Educ. Psychol.* 4:774. doi: 10.3389/fpsyg.2013.00774

Van De Ven, A. (2007). "Engaged scholarship in a professional school," in *Engaged Scholarship: A Guide for Organisational and Social Research*, ed A. Van De Ven (Oxford: Oxford University Press), 14–48.

Wright, J., Brinkley, I., and Clayton, N. S. (2010). *Employability and Skills in the UK: Redefining the Debate*. London: The Work Foundation.

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OPINION ARTICLE
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The future and the female academic leader: advancing student engagement

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The ever-changing face of academic leadership demands constant consideration and as such there is clearly much interest within the community at large to examine this most important of academic roles. To be truly effective the academic leader must be a unique animal who goes beyond merely ensuring that departmental budgets are aligned at the end of the fiscal year but use an ever evolving technological environment to lead in all aspects of teaching, research as well as administrative duties in support of their respective department. In this environment leaders not only need to be aware of, but demonstrate proficiency, in the use of MOOCs, cloud based computing and even efficient use of email software (Huang, 2001; Ruby, 2013). Such a task may seem to be quite unnerving to the new entrants to the field—this is especially relevant for the female academic who may not readily adopt such emerging technologies (Venkatesh and Morris, 2000). However, in a sector where almost all new entrants expect to achieve a leadership position at some point it is important to highlight the current orthodoxy with regards to achieving such a position and any possible mediating role that technology may play. Current research endeavors that highlight the moderating effects of gender in achieving leadership positions within academia are discussed here. It is argued that such research takes a limited perspective on both the roles required with academia but also the unique and very important contributions that female leaders can provide to students. Here, it is clear that the unique collegial and social manner of a female style of leadership that is often seen with managers in industry is an ideal trait for leadership within academia especially with regards to the most important aspect of academia, and often the most overlooked, and that is the student (Eagly and Karau, 1991). Student engagement is a key determinant for improving student motivation, how students approach learning and academic success (Lazaros and Davidson, 2013). It is argued here that technology, particularly the use of email, can play an important role in providing students with access to the unique skill set of certain academic leaders.

Probably the largest examination of the effects of gender on academic leadership is seen with the recent work by Parker and Welch (2013). Here, an extensive analysis of a large scale dataset was carried out to examine how an individual's professional network, an individual's scientific ability or the gender of an individual independently predicted academic leadership at the level of the research center, the level of the university administrator or even at the position of overarching leadership at the level of the specific scientific discipline (Parker and Welch, 2013). This study is indeed a comprehensive analysis and, while not without its limitations, revealed that scientific productivity and reputation predicted leadership roles at the center level but this was moderated by gender. The study also showed a paucity of female academics at the research center and administrative leadership level but found that females held significantly more leadership positions at the wider discipline level. These are the positions that are generally high profile and serve to act as inspirational role models for students who wish to enter that particular field. However, even though Parker and Welch (2013) was clearly an important study they did not fully address what could be considered the most important aspect of academic leadership and that is understanding how interactions between the leaders of academic institutions and the student body can improve the entire learning environment (Smith and Hughey, 2006). Here, it is argued that use of technology can help to ensure that the students fully interact with female leaders within academia and benefit from their style of leadership.

There is no doubt that engaging with students at a social level enhances their overall experience during their course of study and even predicts their actual performance on assessments (Tinto, 1975; Kuh, 1993; Koljatic and Kuh, 2001; Smith et al., 2005). Indeed, we have previously found that undergraduate students consider the quality of their engagement with staff to be the single most important factor in driving their engagement with their programme of study (Towl and Senior, 2010). However, while it is abundantly clear that students do want to have more and more immediacy with their teachers it is not clear if they consider teachers who are discipline leaders as more effective in meeting this requirement.

A female leadership style is typically exemplified by a collegial, friendly and democratic style of social interaction (Bartol, 1974; Eagly and Carli, 2003)[1]. This is the very style of social leadership that students expect. Yet there is seems to be a misalignment occurring between the positioning of leaders to roles where they are likely to be the most effective. As noted above female academics are less likely to find themselves in positions of leadership at the research center or administrative level. However, these are the very roles that are likely to involve interaction with students, which is crucial as students who feel they have a say in their learning or have opportunity to participate in debate, which reflects the democratic approach often employed by female academic leaders, drives higher levels of student engagement (Exeter et al., 2010). This is problematic as the current orthodoxy in academia misaligns the effective leadership abilities of female style of leadership. However, it is with the judicious use of technology to interact with students that academic leaders can indeed play a pivotal role with enhancing the student learning experience.

Email, as a means of communication, is now ubiquitous and it is fair to say that all students enrolling on a programme of higher education are provided with an email account and access to computing facilities by which to use it (Huang, 2001). However, and perhaps more importantly, email exchanges between student and teacher can actually serve a more social role that facilitates the immediacy of staff (Bloch, 2002). Such email driven immediacy is considered in a more positive light by the student cohort and also predicts improvement in subsequent assessments (Sheer and Fung, 2007). While the prevalence of email exchange between student and staff member is considered in a positive light by the student cohort such perceptions are always in the service of the "nurturing, open, nonthreatening, and respectful" relationships with staff members (Anderson and Carta-Falsa, 2002, p. 134). Students simply need to feel that they are respected members of the learning community before they start to develop an independent approach to their learning.

Such community affiliation can be readily developed by the friendly and collegial approach that is diagnostic of a female style leadership. Indeed, these relationship-based behaviors are often considered to be at the very core of effective leadership (Lowe et al., 1996; Bommer et al., 2004). As female academics tend to be discipline level leaders, a position that is traditionally removed from much student facing contact, it would seem that email interaction may be an effective means to ensure that students benefit from the unique collegiality of certain discipline leaders and develop stronger ties to the immediate learning community. The students will get ready access to those leaders who may play an inspirational role model in helping them engage with their studies and shaping their long-term aspirations. The development of such email assisted immediacy should in turn start to see a shift away from the current model of management that has evolved in academia where large groups of students end up having little contact with the discipline lead (Hubel, 2009). In today's academic environment, with the ever-growing list of demands placed on its leaders, it is intriguing to suggest that that by merely using e-mail we may see a return to the model of practice within academia where experience is shared universally and not communicated in a predominantly hierarchical fashion.

[1]It is worth noting that such a style of leadership is not gender specific and can be demonstrated by both male and female leaders (See Fitzgerald, 2014 for an excellent discussion on this area).

REFERENCES

Anderson, L., and Carta-Falsa, J. (2002). Factors that make the faculty and student relationships effective. *Coll. Teach.* 50, 134–138. doi: 10.1080/87567550209595894

Bartol, K. (1974). Male versus female leaders: the effect of leader need for dominance on follower satisfaction. *Acad. Manag. J.* 17, 225–233. doi: 10.2307/254976

Bloch, J. (2002). Student/Teacher interaction via email: the social context of internet discourse. *J. Sec. Lang. Writ.* 11, 117–134. doi: 10.1016/S1060-3743(02)00064-4

Bommer, W., Rubin, R., and Baldwin, T. (2004). Setting the stage for effective leadership: antecedents of transformational leadership behavior. *Leader. Q.* 15, 195–210. doi: 10.1016/j.leaqua.2004.02.012

Eagly, A., and Carli, L. (2003). The female leadership advantage: an evaluation of the evidence. *Leader. Q.* 14, 807–834. doi: 10.1016/j.leaqua.2003.09.004

Eagly, A., and Karau, S. (1991). Gender and the emergence of leaders: a meta-analysis. *J. Personal. Soc. Psychol,* 60, 685–710. doi: 10.1037/0022-3514.60.5.685

Exeter, J., Ameratunga, S., Ratima, M., Morton, S., Dickson, M., Hsu, D., et al. (2010). Student engagement in very large classes: the teachers' perspective. *Stud. High. Edu.* 35, 761–775. doi: 10.1080/03075070903545058

Fitzgerald, T. (2014). *Women Leaders in Higher Education: Shattering the myths.* London: Routledge.

Huang, A. (2001). Innovative use of email for Teaching. *Comm. ACM,* 44, 29–32. doi: 10.1145/384150.384157

Hubel, D. (2009). The way biomedial research is organised has dramatically changed over the past half century: are the changes for the better ? *Neuron* 64, 161–163. doi: 10.1016/j.neuron.2009.09.022

Koljatic, M., and Kuh, G. (2001). A longitudinal assessment of college student engagement in good practices in undergraduate education. *High. Educ.* 43, 351–371. doi: 10.1023/A:1017993113390

Kuh, G. (1993). In their own words: what students learn outside the classroom. *Am. Educ, Res. J.* 30, 277–304. doi: 10.3102/00028312030002277

Lazaros, E. J., and Davidson, C. J. (2013). Improving student engagement. *Contin. J. Arts Human.* 5, 55–59. doi: 10.1017/S1472669612000680

Lowe, K., Kroeck, K., and Sivasubramaniam, N. (1996). Effectiveness correlates of transformational and transactional leadership: a meta-analytic review. *Leader. Q.* 7, 385–425. doi: 10.1016/S1048-9843(96)90027-2

Parker, M., and Welch, E. (2013). Professional networks, science ability, and gender determinants of three types of leadership in academic science and enegineering. *Leader. Q.* 24, 332–348. doi: 10.1016/j.leaqua.2013.01.001

Ruby, A. (2013). *Massive, Open, Online Appraisals. Times Higher Education*. Available online at: http://www.timeshighereducation.co.uk/comment/opinion/massive-open-onlineappraisals/2003678.article

Sheer, V., and Fung, T. (2007). Can email communication enhance Professor -Student Relationships and the student evaluation of the Professor? Some Empirical Evidence. *J. Educ. Comput. Res.* 37, 289–306. doi: 10.2190/EC.37.3.d

Smith, B., and Hughey, A. (2006). Leadership in higher education - its evolution and potential: a unique role facing critical challenges. *Indus. High. Educ.* 20, 157–163. doi: 10.5367/000000006777690972

Smith, K., Sheppard, S., Johnson, D., and Johnson, R. (2005). Pedagogies of engagment: classroom based practices. *J. Eng. Educ.* 94, 87–101. doi: 10.1002/j.2168-9830.2005.tb00831.x

Tinto, V. (1975). Dropout from higher education: a theoretical synthesis of recent research. *Rev.*

Educ. Res. 45, 89–125. doi: 10.3102/0034654304 5001089

Towl, M., and Senior, C. (2010). Undergraduate research training and graduate recruitment. *Educ. Train.* 52, 292–303. doi: 10.1108/00400911011050963

Venkatesh, V., and Morris, M. (2000). Why don't men ever stop to ask for Directions? Gender, social influence and their role in technology acceptance and Behaviour. *MIS Q.* 24, 115–139. doi: 10.2307/3250981

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Group work as an incentive for learning – students' experiences of group work

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Group work is used as a means for learning at all levels in educational systems. There is strong scientific support for the benefits of having students learning and working in groups. Nevertheless, studies about what occurs in groups during group work and which factors actually influence the students' ability to learn is still lacking. Similarly, the question of why some group work is successful and other group work results in the opposite is still unsolved. The aim of this article is to add to the current level of knowledge and understandings regarding the essence behind successful group work in higher education. This research is focused on the students' experiences of group work and learning in groups, which is an almost non-existing aspect of research on group work prior to the beginning of the 21st century. A primary aim is to give university students a voice in the matter by elucidating the students' positive and negative points of view and how the students assess learning when working in groups. Furthermore, the students' explanations of why some group work ends up being a positive experience resulting in successful learning, while in other cases, the result is the reverse, are of interest. Data were collected through a study-specific questionnaire, with multiple choice and open-ended questions. The questionnaires were distributed to students in different study programs at two universities in Sweden. The present result is based on a reanalysis and qualitative analysis formed a key part of the study. The results indicate that most of the students' experiences involved group work that facilitated learning, especially in the area of academic knowledge. Three important prerequisites (learning, study-social function, and organization) for group work that served as an effective pedagogy and as an incentive for learning were identified and discussed. All three abstractions facilitate or hamper students' learning, as well as impact their experiences with group work.

Keywords: group work, collaborative learning, cooperative learning, higher education, students' perspectives, qualitative research

INTRODUCTION

Group work is used as a means for learning at all levels in most educational systems, from compulsory education to higher education. The overarching purpose of group work in educational practice is to serve as an incentive for learning. For example, it is believed that the students involved in the group activity should "learn something." This prerequisite has influenced previous research to predominantly focus on how to increase efficiency in group work and how to understand why some group work turns out favorably and other group work sessions result in the opposite. The review of previous research shows that in the 20th century, there has been an increase in research about students' cooperation in the classroom (Lou et al., 1996; Gillies and Boyle, 2010, 2011). This increasing interest can be traced back to the fact that both researchers and teachers have become aware of the positive effects that collaboration might have on students' ability to learn. The main concern in the research area has been on how interaction and cooperation among students influence learning and problem solving in groups (Hammar Chiriac, 2011a,b).

Two approaches concerning learning in group are of interest, namely *cooperative learning* and *collaborative learning*. There seems to be a certain amount of confusion concerning how these concepts are to be interpreted and used, as well as what they actually signify. Often the conceptions are used synonymously even though there are some differentiations. Cooperative group work is usually considered as a comprehensive umbrella concept for several modes of student active working modes (Johnson and Johnson, 1975; Webb and Palincsar, 1996), whereas *collaboration* is a more of an exclusive concept and may be included in the much wider concept cooperation (Hammar Chiriac, 2011a,b). Cooperative learning may describe group work without any interaction between the students (i.e., the student may just be sitting next to each other; Bennet and Dunne, 1992; Galton and Williamson, 1992), while collaborative learning always includes interaction, collaboration, and utilization of the group's competences (Bennet and Dunne, 1992; Galton and Williamson, 1992; Webb and Palincsar, 1996).

At the present time, there is strong scientific support for the benefits of students learning and working in groups. In addition, the research shows that collaborative work promotes both academic achievement and collaborative abilities (Johnson and Johnson, 2004; Baines et al., 2007; Gillies and Boyle,

2010, 2011). According to Gillies and Boyle (2011), the benefits are consistent irrespective of age (pre-school to college) and/or curriculum. When working interactively with others, students learn to inquire, share ideas, clarify differences, problem-solve, and construct new understandings. Gillies (2003a,b) also stresses that students working together are more motivated to achieve than they would be when working individually. Thus, group work might serve as an incentive for learning, in terms of both academic knowledge and interpersonal skills. Nevertheless, studies about what occur in groups during group work and which factors actually influence the students' ability to learn is still lacking in the literature, especially when it comes to addressing the students' points of view, with some exceptions (Cantwell and Andrews, 2002; Underwood, 2003; Peterson and Miller, 2004; Hansen, 2006; Hammar Chiriac and Granström, 2012). Similarly, the question of why some group work turns out successfully and other work results in the opposite is still unsolved. In this article, we hope to contribute some new pieces of information concerning the why some group work results in positive experiences and learning, while others result in the opposite.

GROUP WORK IN EDUCATION

Group work is frequently used in higher education as a pedagogical mode in the classroom, and it is viewed as equivalent to any other pedagogical practice (i.e., whole class lesson or individual work). Without considering the pros and cons of group work, a non-reflective choice of pedagogical mode might end up resulting in less desirable consequences. A reflective choice, on the other hand, might result in positive experiences and enhanced learning (Galton et al., 2009; Gillies and Boyle, 2011; Hammar Chiriac and Granström, 2012).

GROUP WORK AS OBJECTIVE OR MEANS

Group work might serve different purposes. As mentioned above, the overall purpose of the group work in education is that the students who participate in group work "learn something." Learning can be in terms of academic knowledge or "group knowledge." Group knowledge refers to learning to work in groups (Kutnick and Beredondini, 2009; Gillies and Boyle, 2010, 2011; Hammar Chiriac, 2011a,b). Affiliation, fellowship, and welfare might be of equal importance as academic knowledge, or they may even be prerequisites for learning. Thus, the group and the group work serve more functions than just than "just" being a pedagogical mode. Hence, before group work is implemented, it is important to consider the purpose the group assignment will have as the objective, the means, or both.

From a learning perspective, group work might function as both *an objective* (i.e., learning collaborative abilities) and *as the means* (i.e., a base for academic achievement) or *both* (Gillies, 2003a,b; Johnson and Johnson, 2004; Baines et al., 2007). If the purpose of the group work is to serve as an objective, the group's function is to promote students' development of group work abilities, such as social training and interpersonal skills. If, on the other hand, group work is used as a means to acquire academic knowledge, the group and the collaboration in the group become a base for students' knowledge acquisition (Gillies, 2003a,b; Johnson and Johnson, 2004; Baines et al., 2007). The group contributes to the acquisition of knowledge and stimulates learning, thus promoting academic performance. Naturally, group work can be considered to be a learning environment, where group work is used both as an objective and as the means. One example of this concept is in the case of tutorial groups in problem-based learning. Both functions are important and might complement and/or even promote each other. Albeit used for different purposes, both approaches might serve as an incentive for learning, emphasizing different aspect knowledge, and learning in a group within an educational setting.

WORKING IN A GROUP OR AS A GROUP

Even if group work is often defined as "pupils working together as a group or a team," (Blatchford et al., 2003, p. 155), it is important to bear in mind that group work is not just one activity, but several activities with different conditions (Hammar Chiriac, 2008, 2010). This implies that group work may change characteristics several times during a group work session and/or during a group's lifetime, thus suggesting that certain working modes may be better suited for different parts of a group's work and vice versa (Hammar Chiriac, 2008, 2010). It is also important to differentiate between how the work is accomplished in the group, whether by working in a group or working as a group.

From a group work perspective, there are two primary ways of discussing cooperation in groups: working *in a group* (cooperation) or working *as a group* (collaboration; Underwood, 2003; Hammar Chiriac and Granström, 2012). Situations where students are sitting together in a group but working individually on separate parts of a group assignment are referred to as working *in a group*. This is not an uncommon situation within an educational setting (Gillies and Boyle, 2011). Cooperation between students might occur, but it is not necessary to accomplish the group's task. At the end of the task, the students put their separate contributions together into a joint product (Galton and Williamson, 1992; Hammar Chiriac, 2010, 2011a). While no cooperative activities are mandatory while working in a group, cooperative learning may occur. However, the benefits in this case are an effect of social facilitation (Zajonc, 1980; Baron, 1986; Uziel, 2007) and are not caused by cooperation. In this situation, social facilitation alludes to the enhanced motivational effect that the presence of other students have on individual student's performance.

Working *as a group,* on the other hand, causes learning benefits from collaboration with other group members. Working as a group is often referred to as "real group work" or "meaningful group work," and denotes group work in which students utilizes the group members' skills and work together to achieve a common goal. Moreover, working as a group presupposes collaboration, and that all group members will be involved in and working on a common task to produce a joint outcome (Bennet and Dunne, 1992; Galton and Williamson, 1992; Webb and Palincsar, 1996; Hammar Chiriac, 2011a,b). Working as a group is characterized by common effort, the utilization of the group's competence, and the presence of problem solving and reflection. According to Granström (2006), working as a group is a more uncommon activity in an educational setting. Both approaches might be useful in different parts of group work, depending on the purpose of the group work and type of task

assigned to the group (Hammar Chiriac, 2008). Working in a group might lead to cooperative learning, while working as group might facilitate collaborative learning. While there are differences between the real meanings of the concepts, the terms are frequently used interchangeably (Webb and Palincsar, 1996; Hammar Chiriac, 2011a,b; Hammar Chiriac and Granström, 2012).

PREVIOUS RESEARCH OF STUDENTS' EXPERIENCES

As mentioned above, there are a limited number of studies concerning the participants' perspectives on group work. Teachers often have to rely upon spontaneous viewpoints and indications about and students' experiences of group work in the form of completed course evaluations. However, there are some exceptions (Cantwell and Andrews, 2002; Underwood, 2003; Peterson and Miller, 2004; Hansen, 2006; Hammar Chiriac and Einarsson, 2007; Hammar Chiriac and Granström, 2012). To put this study in a context and provide a rationale for the present research, a selection of studies focusing on pupils' and/or students' experiences and conceptions of group work will be briefly discussed below. The pupils' and/or students inside knowledge group work may present information relevant in all levels of educational systems.

Hansen (2006) conducted a small study with 34 participating students at a business faculty, focusing on the participants' experiences of group work. In the study different aspects of students' positive experiences of group work were identified. For example, it was found to be necessary that all group members take part and make an effort to take part in the group work, clear goals are set for the work, role differentiation exists among members, the task has some level of relevance, and there is clear leadership. Even though Hansen's (2006) study was conducted in higher education, these findings may be relevant in other levels in educational systems.

To gain more knowledge and understand about the essence behind high-quality group work, Hammar Chiriac and Einarsson (2007) turned their focus toward students' experiences and conceptions of group work in higher education. A primary aim was to give university students a voice in the matter by elucidating their students' points of view and how the students assess working in groups. Do the students' appreciate group projects or do they find it boring and even as a waste of time? Would some students prefer to work individually, or even in "the other group?" The study was a part of a larger research project on group work in education and only a small part of the data corpus was analyzed. Different critical aspects were identified as important incitements for whether the group work turned out to be a success or a failure. The students' positive, as well as negative, experiences of group work include both task-related (e.g., learning, group composition, participants' contribution, time) and socio-emotional (e.g., affiliation, conflict, group climate) aspects of group work. The students described their own group, as well as other groups, in a realistic way and did not believe that the grass was greener in the other group. The same data corpus is used in this article (see under Section The Previous Analysis). According to Underwood (2003) and Peterson and Miller (2004), the students' enthusiasm for group work is affected by type of task, as well as the group's members. One problem that recurred frequently concerned students who did not contribute to the group work, also known as so-called free-riders (Hammar Chiriac and Hempel, 2013). Students are, in general, reluctant to punish free-riders and antipathy toward working in groups is often associated with a previous experience of having free-riders in the group (Peterson and Miller, 2004). To accomplish a favorable attitude toward group work, the advantages of collaborative activities as a means for learning must be elucidated. Furthermore, students must be granted a guarantee that free-riders will not bring the group in an unfavorable light. The free-riders, on the other hand, must be encouraged to participate in the common project.

Hammar Chiriac and Granström (2012) were also interested in students' experiences and conceptions of high-quality and low-quality group work in school and how students aged 13–16 describe good and bad group work? Hammar Chiriac and Granström (2012) show that the students seem to have a clear conception of what constitutes group work and what does not. According to the students, genuine group work is characterized by collaboration on an assignment given by the teacher. They describe group work as working together with their classmates on a common task. The students are also fully aware that successful group work calls for members with appropriate skills that are focused on the task and for all members take part in the common work. Furthermore, the results disclose what students consider being important requisites for successful versus more futile group work. The students' inside knowledge about classroom activities ended up in a taxonomy of crucial conditions for high-quality group work. The six conditions were: (a) organization of group work conditions, (b) mode of working in groups, (c) tasks given in group work, (d) reporting group work, (e) assessment of group work, and (f) the role of the teacher in group work. The most essential condition for the students seemed to be group composition and the participants' responsibilities and contributions. According to the students, a well-organized group consists of approximately three members, which allows the group to not be too heterogeneous. Members should be allotted a reasonable amount of time and be provided with an environment that is not too noisy. Hence, all six aspects are related to the role of the teacher's leadership since the first five points concern the framework and prerequisites created by the teacher.

Näslund (2013) summarized students' and researchers' joint knowledge based on experience and research on in the context of shared perspective for group work. As a result, Näslund noticed a joint apprehension concerning what constitutes "an ideal group work." Näslund (2013) highlighted the fact that both students and researchers emphasized for ideal group work to occur, the following conditions were important to have: (a) the group work is carried out in supportive context, (b) cooperation occurs, (c) the group work is well-structured, (d) students come prepared and act as working members during the meetings, and (e) group members show respect for each other.

From this brief exposition of a selection of research focusing on students' views on group work, it is obvious that more systematic studies or documentations on students' conceptions and experiences of group work within higher education are relevant and desired. The present study, which is a reanalysis of a corpus of data addressing the students' perspective of group, is a step in that direction.

AIM OF THE STUDY

The overarching knowledge interest of this study is to enhance the body of knowledge regarding group work in higher education. *The aim* of this article is to add knowledge and understanding of what the essence behind successful group work in higher education is by focusing *on the students' experiences and conceptions of group work and learning in groups*, an almost non-existing aspect of research on group work until the beginning of the 21st century. A primary aim is to give university students a voice in the matter by elucidating the students' positive and negative points of view and how the students assess learning when working in groups. Furthermore, the students' explanations of why some group work results in positive experiences and learning, while in other cases, the result is the opposite, are of interest.

MATERIALS AND METHODS

To capture university students' experiences and conceptions of group work, an inductive qualitative approach, which emphasizes content and meaning rather than quantification, was used (Breakwell et al., 2006; Bryman, 2012). The empirical data were collected through a study-specific, semi-structured questionnaire and a qualitative content analysis was performed (Mayring, 2000; Graneheim and Lundman, 2003; Elo and Kyngäs, 2007).

PARTICIPANTS

All participating students attended traditional university programs where group work was a central and frequently used pedagogical method in the educational design. In addition, the participants' programs allowed the students to be allocated to the same groups for a longer period of time, in some cases during a whole semester. University programs using specific pedagogical approaches, such as problem-based learning or case method, were not included in this study.

The participants consisted of a total of 210 students, 172 female and 38 male, from two universities in two different cities (approximately division: 75 and 25%). The students came from six different populations in four university programs: (a) The Psychologist Program/Master of Science in Psychology, (b) The Human Resource Management and Work Sciences Program, (c) Social Work Program, and (d) The Bachelor's Programs in Biology. The informants were studying in their first through eighth terms, but the majority had previous experiences from working in other group settings. Only 2% of the students had just started their first term when the study was conducted, while the vast majority (96%) was participating in university studies in their second to sixth semester.

The teacher most frequently arranged the group composition and only a few students stated that they have had any influence on the group formation. There were, with a few exceptions, between 6 and 10 groups in each of the programs included in this study. The groups consisted of between four to eight members and the differences in sizes were almost proportionally distributed among the research group. The groups were foremost heterogeneous concerning gender, but irrespective of group size, there seems to have been a bias toward more women than men in most of the groups. When there was an underrepresented sex in the group, the minority mostly included two students of the same gender. More than 50% of the students answered that in this particularly group, they worked solely with new group members, i.e., students they had not worked with in previous group work during the program.

MATERIALS

To collect data about students' experiences and conceptions of group work, a study-specific, semi-structured questionnaire was constructed. The questionnaire approached the students' experiences regarding the specific group work they were working in at the time of the data collection (spring 2006), not their experiences of group work in general. The questionnaire contained a total of 18 questions, including both multiple choice and open-ended questions. The multiple choice questions concerned background variables and information about the present group. The seven open-ended questions were designed to gather data about the students' experiences and perceptions of group work in higher education. The questionnaires were distributed to the different populations of students (some populations studied at the same program) at two universities in Sweden. During the time the questionnaires were completed, the researcher or an assistant was present to answer possible questions. In all, 210 students answered the questionnaire.

ANALYSIS

The previous analysis

As described above (Section Previous Research of Students' Experiences) a previous analysis based on the same data corpus revealed that most of the students included in the study found group work to be an enjoyable and stimulating working method (Hammar Chiriac and Einarsson, 2007). The data were analyzed using a qualitative content analysis based on three different research questions. There were two main criticisms of the previous study presented from other researchers. The criticism conveyed applied mostly to the question of whether we could assemble these groups into a joint research group and second to the fact that the results were mostly descriptive. To counter this criticism and to elaborate on the analysis, a further analysis was conducted.

The present analysis

The present analysis (or reanalysis) was conducted by using an inductive qualitative content analysis based on three open-ended research questions:

(1) In what ways does group work contribute to your learning?
(2) What positive experiences have you had while working in your present group?
(3) What negative experiences have you had while working in your present group?

Each question corresponds to one aspect of the research's objective, but together, they might support and enrich each other and unravel new information based on the students' experiences and conceptions of group work. Research question 1, listed above, was not included in the first analysis and is being investigated for the first time in this study, while the other two questions are being reanalyzed. An inductive, qualitative content analysis is applicable when the aim of the research is a description of the meaning or of a phenomenon in conceptual form (Mayring, 2000; Graneheim and Lundman, 2003; Elo and Kyngäs, 2007).

The analysis was carried out over several steps, following the basic principles of an inductive, qualitative content analysis (Mayring, 2000; Graneheim and Lundman, 2003; Elo and Kyngäs, 2007). The steps included three phases: preparation, organizing, and reporting (Elo and Kyngäs, 2007). Each question was treated as a unit of analysis and was thus analyzed separately. In the *preparation* phase, the researcher tried to make sense of the data by becoming familiar with the data corpus. In the current study, this included transcription and thorough reading of the answers. An open coding system composed of marginal notes and headings began the second phase, which included *organizing* the data. This second phase, in turn, included open coding, creating categories, and abstraction. The notes and the headings from the open coding were transferred to coding sheets and then grouped into categories. Categories were formed through the interpretation of the codes that described the same meaning or phenomenon. Finally, an abstraction process began, where a general description of the grouped categories formed an abstraction (see **Table 1**). An abstraction was denominated using the content-characteristic words for this paper: *learning, study-social function,* and *organization.* The third phase, *reporting*, addressed the presentation of the process of analysis and the results.

The final aim of this study is to present the phenomenon studied in a model or conceptual map of the categories (Elo and Kyngäs, 2007). In following these procedures, we aim to expand our understanding of the existing work and to counter the second part of the criticisms, which included criticisms stating that the results were mostly descriptive in nature. To counter the criticisms regarding the question of whether we could assemble these groups into a joint research group, the qualitative abstraction that emerged from the qualitative content analysis was compared to background information by using SPSS. Three background variables were used: gender, cities, and programs.

Table 1 | Examples from the organization phase of the coding process.

Abstractions	Categories	Codes (examples)
Learning	Facilitate	
	- Academic learning	- Learn more
		- Discussing and questioning
		- New perspectives
	- "Group knowledge"	- Learn about groups by working in groups
		- Social training
		- Interpersonal skills
	Hamper learning	- Out of focus
		- Ineffective
		- Conflicts
Study-social function	Facilitate	
	- Affiliation	- Membership
		- Belonging
		- Friends
	- For the individual student	- Relief
		- Support
		- Motivation
		- Confirmation
	Hamper	- Group climate
		- Negative conceptions
		- Influenced by bad temper
Organization	Facilitate	- Group composition
		- Group structure
		- Way of working
		- Contributions
	Hamper	- Group composition
		- Group structure
		- Way of working
		- Contributions

ETHICS AND QUALITY

The ethical principles provided by the British Psychology Society have formed a guideline [British Psychology Society (BPS), 2006] for the present study. The ethical principles, which emphasize the concern for participants' interest, have been applied throughout the study [American Psychological Association (APA), 2002; British Psychology Society (BPS), 2004; Barett, 2007]. To facilitate trustworthiness, a thorough description of the analysis process has been presented (Graneheim and Lundman, 2003; Elo and Kyngäs, 2007). Translated citations are also included to increase trustworthiness.

RESULTS

As described above, the analysis resulted in three abstraction emerging: *learning, study-social function*, and *organization.* Each abstraction includes both a positive variant (i.e., facilitating learning, study-social function, and/or organization) as well as a negative alternative (i.e., hampering learning, study-social function, and/or organization). The results will be presented in three different sections, with each section corresponding to one abstraction. However, we would like to call attention to the fact that one fifth (20%, including missing value 8%) of the students included in this study did not perceive and/or mention any negative experiences at all in their present group. From a general point of view, there is no difference with respect to gender or city regarding the distribution of positive and negative experiences concerning the abstractions, neither concerning different programs nor the distribution of negative experiences (all $p > 0.05$). In contrast, there is a difference between the various programs and the distribution of positive experiences ($\chi^2 = 14.474$; df: 6; $p < 0.025$). The students from the social work program display a higher amount of positive experiences in connection with a study-social function and organizing in comparison with the other programs.

LEARNING

The majority of the students (97%) responded that working in group somehow *facilitated learning,* academic knowledge, collaborative abilities or both. They learned more or different things when working in groups than they would have if working alone. By discussing and questioning each other's points of view and listening to their fellow students' contributions, thus obtaining different perspectives, the participants experienced an enhanced academic learning, compared to working alone. "I learn much more by working in groups than working individually. I obtain more through interaction with the other group members." Academic knowledge is not the only type of knowledge learned through group work. In addition to academic knowledge, students also gain advanced knowledge about how groups work, how the students function as individual members of groups and how other members behave and work in groups. Some of the respondents also argued that group work in group courses strengthen the combination between empirical and theoretical learning, thus learning about groups by working in groups. "Through practical knowledge demonstrate several of the phenomena we read about in theory (group psychology and sociology)."

The results show no difference when considering either gender or city. However, when comparing the four programs included in the study and the types of learning, a difference occurs ($\chi^2 = 14.474$; df: 6; $p < 0.025$). A division into two parts seems to generate the difference. On the one hand, the students from the Bachelor's Program in Biology and the students from the Human Resource Management and Work Sciences Program emphasize academic knowledge. On the other hand, students from the Psychologist Program/Master of Science in Psychology and Social Work Program more often mentioned learning collaborative abilities single handed, as well as a combination of academic knowledge and group learning.

Even though the participants did not expressly report that group work *hampered learning,* they often mentioned that they perceived group work as being ineffective due to loss of focus and the presence of conflicts, thereby hampering conceivable learning. One respondent stated, "that you sometimes are out of focus in the discussion and get side-tracked instead of considering the task." Another offered the following perspective: "Occasionally, it is too little task related and feels unnecessary sometimes. Individual work is, in certain situations, preferable." Group work might be perceived as ineffective and time consuming considering long working periods with tedious discussions. One participant stated, "The time aspect, everything is time consuming." The absence or presence of conflicts in the group affects students' experiences, and conflicts not handled may influence learning in a negative way. The students perceived that it was difficult to come to an agreement and experience those conflicts and the need to compromise hampered individual learning. Accordingly, the absence of conflicts seemed to be an important incitement for learning. However, fear of conflicts can lead to reduced learning and cause negative experiences, but to a considerably lesser extent than does the presence of actual conflicts. "A great fear of conflicts sometimes raises an oppressive atmosphere." "Fear of conflicts leads to much not made known."

A STUDY-SOCIAL FUNCTION

Group work also has an important *study-social function* according to the students. They describe their membership in groups as an important aspect of affiliation. In general, the total number of students at a program is approximately 60–80 or more. In contexts with a large population of students, the smaller group gives the participants an opportunity to feel affiliated with the group and to each other. "Feels safe to have a certain group to prepare oneself together with before, for instance, an upcoming seminar." The group gives the individual student a platform of belonging, which might serve as an important arena for learning (*facilitate*) and finding friends to spend leisure time with. Many of the participants also reported feeling a positive atmosphere in the group, which is important for the satisfaction of being in the group together with the fellow students.

To be a member of a group may also serve as a function of relief, both academically and socially, for the individual student. The participants reported that many of the tasks assigned by the university teachers are difficult to handle on their own. "The others explain to me. We help one another." However, the students reported that they helped and supported each other, even if the task did not demand cooperation. "As a student, you get more active. You help one another to extract the groups' common knowledge. Forward info if somebody is missing." Being a member of a group also affects students' motivation to study. They prepare themselves by reading texts and other material before the next group session. Group work may also have positive effects on achievement. Students' total amount of time and effort on their work may also increase. Through group work, the participants also get confirmation of who they are and what their capacities are.

Being a member of a group also has its downside, which often has to do with the group climate and/or group processes, both of which have multiple and complex features. Many students reported that both the group climate and group processes might be the source of negative conceptions of the group and *hamper* learning. "Process losses." The respondents described negative conceptions based on the feeling of not having enough time to get to know each other in the group or being in situations where no cooperation occurred. Other students referred to the fact that the group's life is too long, which may lead to group members not only wearing each other out, but also having a negative effect on each other's mood. "Influenced by each other's mood." Examples of negative experiences are process losses in general, including insufficient communication, unclear roles, and problems with one group member. As mentioned above, the students from the Social Work Program display a higher number of positive experiences in connection with a study-social function and organizing in comparison with students from the other programs.

ORGANIZATION

O*rganization* concerns the structure of group work and includes different aspects, all describing group work from different angles. The aspects are relevant no matter how the participants perceive the group work, whether as positive or negative. Unlike the other two abstractions (learning and study-social function), organization includes the same aspects no matter what the experiences are,

namely *group composition*, *group structure*, *way of working* and *contributions*.

Whether the group is *composed* in a homogeneous or heterogeneous way seems to be experienced in both a positive and negative sense. A well-thought-out *group composition*, including both group size and mix of members, is essential. A just large-enough group for the task, consisting of a population of members that is not too heterogeneous, *facilitates* a joyful experience and learning. A homogeneous mix of members might be perceived as positive, as the students feel that they have similar life situations, opinions, and skills, thereby causing positive conditions for collaboration within the group. Conversely, in a group with a heterogeneous mix, different members contribute with different knowledge and/or prior experiences, which can be used in the group for collective and collaborative learning. "Good group composition, distribution of age groups that leads to fruitful discussions."

An additional facilitating prerequisite is that the group develops adequate *ways of working* together, which includes a well-organized *group structure*. Well-working groups are characterized as having developed adequate ways of working together, while groups that work less well together lack a developed way of cooperation. "Well-organized working group with clear and distinct rules and structure." Preparation and attendance for group work are aspects mentioned as facilitating (and hampering) incitements. Group work in educational settings sometimes entails that you, as a student, are forced to read and learn within a certain period of time that is beyond your control. Some participants find the pressure positive, hence "increase the pressure to read chapters in time." The members' *contribution* to the group is also a central factor for the students' apprehension of how the group works. This is, in short, about how much each member ought to contribute to the group and to the work. Groups considered to be well-working are ones where all members contribute to the group's work, but the content of the contribution may vary according to the single member's qualifications. "We work well together (most of us). Everybody participates in different ways and seems committed." "Good, everybody participates the same amount. We complement each other well."

The same prerequisites can lead to the reverse result, i.e., *hampering* learning and stirring up negative experiences. If the group members are too identical (a homogeneous *group composition*), it might lead to a lack of opinions, which several participants perceived as being negative. "That we do not get a male perspective about the subject. We are all girls, at the age of 20, which also means that we have pretty much the same experiences that may be seen as both positive and negative. The negative is the lack of opinion." If the group is considered to be too small, students seems to find it troublesome, as the relationships are few, but there are also few people who are available to handle the workload allotted to the group. Nevertheless, a group that is too large could also lead to negative experiences. "It is far too large a group."

A lack of *group structure* might lead to a lower degree of satisfaction with the group's *way of working*. A commonly expressed point of view seen in the students' answers involved the occurrences of when all members did not attend the meetings (absence). In these cases, it was also viewed that the work in the group often was characterized as unstructured. "Sometimes a bit unclear structures, some students have difficulties with coming in time." Not attending or coming unprepared or badly prepared to the group work is other aspect that is commented on. "Low degree of fellowship, punctuality is a problem, an insecure group." Some students find it frustrating to prepare for a certain time decided that is beyond their control. "A necessity to read certain chapters within a specific period of time is never stimulating."

One characteristic of groups that are not working well is that *contribution* varies among the members. In group work, students with different levels of ambition are assembled, which may result in different levels of interest and commitment, as well as differences in the willingness to take on responsibilities or part of the workload of the group's work. Some members are active and do much of the work, while others barely contribute at all. "Some don't do anything while others pull the heaviest burden. Two out of three prepare before the meeting, the rest think that they are able to read during the group work and do not supply the group with anything else other than delays and frustration." A common answer seen in the questionnaires that concerns negative experiences of group work as they relate to contribution is: "Everybody does not contribute just as much." or "There is always someone who just glides along and doesn't take part."

SUMMARY OF THE RESULTS

The results are summarized in a model illustrating the relationship between abstractions (i.e., learning, study-social function, and organization) and result (i.e., enhanced or reduced learning), as well as positive or negative experiences (see **Figure 1**).

The figure shows that all three abstractions may facilitate or hamper learning as well as the experiences of group work. To piece together, the difficult and extensive jigsaw puzzle concerning why some group work result in positive experiences and learning, while in other cases the result is the reverse is still not solved. In

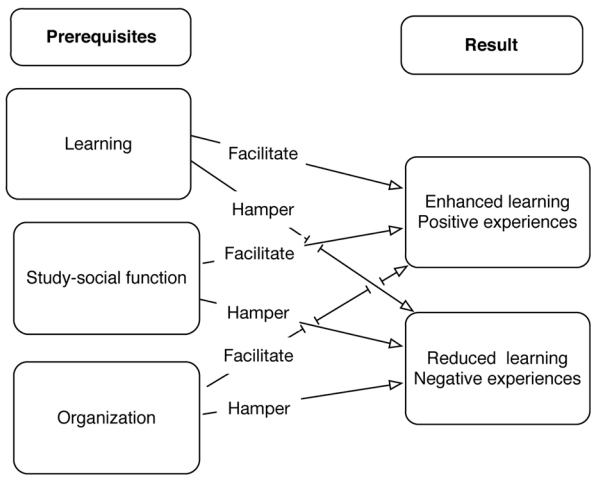

FIGURE 1 | A model illustrating the relationship between abstractions and result.

this article, we propose that the prerequisites learning, study-social function, and organization influence learning and experiences of working in group, thus, providing additional pieces of information to the jigsaw puzzle (**Figure 2**).

DISCUSSION

The current study focuses on university students' experiences and conceptions of group work and learning in groups. A primary aim was to give university students a voice in the matter by elucidating the students' positive and negative points of view, as well as how the students' assess learning when working in groups. The analysis resulted in the emergence of three different abstractions: learning, study-social function, and organizations. Each abstraction also included a positive and a negative variant. In other words, all three abstractions either facilitated or hampered university students' learning, as well as their experiences of group work.

LEARNING IN GROUP WORK

The result shows that the majority of the students (97%) experience that working in group *facilitated learning,* either academic knowledge, collaborative abilities or both, accordingly confirming previous research (Johnson and Johnson, 2004; Baines et al., 2007; Gillies and Boyle, 2010, 2011). According to the students, they learn more or different things when working in groups compared with working individually. Academic knowledge was not the only type of knowledge learned through group work. In addition to academic knowledge, students also gained advanced knowledge about how groups work, how the students function as individual members of groups and how other members behave and work in groups. Some of the respondents also argued that group work might strengthen the combination between empirical and theoretical learning, thus the students were learning about groups by working in groups. This implies that group work, from a learning perspective, serves several functions for the students (Kutnick and Beredondini, 2009; Gillies and Boyle, 2010, 2011; Hammar Chiriac, 2011a,b). Group work also seems to have an important study-social function for the university students, hence confirming that group work serves more functions than just being a pedagogical mode.

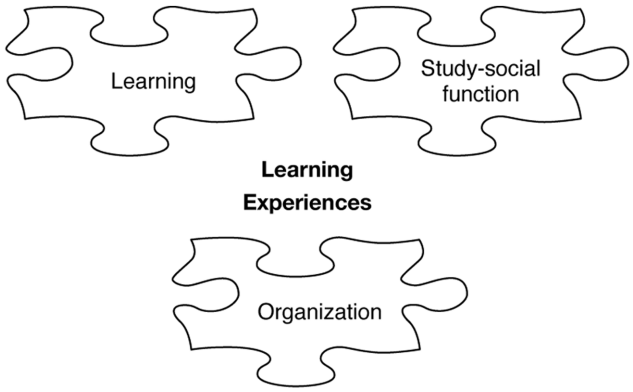

FIGURE 2 | Pieces of jigsaw puzzle influence learning and experiences.

Affiliation, fellowship, and welfare seem to be highly important, and may even be essential prerequisites for learning. Accordingly, group work functions as both as an objective (i.e., learning collaborative abilities), and as the means (i.e., a base for academic achievement), or both, for the students (Gillies, 2003a,b; Johnson and Johnson, 2004; Baines et al., 2007). Moreover, the students from the Bachelor's Program in Biology and the students from the Program for Human Resources seem to use group work more as means for obtaining academic knowledge. In contrast, students from the Psychologist Program/Master of Science in Psychology and Social Work Program more often mentioned learning collaborative abilities alone, as well as a combination of academic knowledge and group learning, thus using group work as an objective, as a means, or as a combination of both. One interpretation might be that the type of task assigned to the students differs in various programs. This can be valid both concerning the purpose of group work (group work as objective or as the means), but also arrangement (working in a group or as a group; Underwood, 2003; Hammar Chiriac and Granström, 2012). Another possible explanation might be that the main emphasis in the Bachelor's Program in Biology and the Program for Human Resources is on product and academic knowledge, while in the Psychologist Program/Master of Science in Psychology and Social Work Program, the process is more articulated and demanded. However, this is only speculation and further research is needed.

Even though the participants did not explicitly state that group work *hampered learning,* they mentioned that they perceived group work to be ineffective due to the loss of focus and/or the presence of conflicts with other group members, thereby hampering conceivable learning. This may also be an effect of the purpose or arrangement of the group work (Cantwell and Andrews, 2002; Underwood, 2003; Peterson and Miller, 2004; Hansen, 2006; Hammar Chiriac and Granström, 2012; Hammar Chiriac and Hempel, 2013).

EXPERIENCES OF GROUP WORK

The results revealed that several aspects of group work are important incentives for learning. In addition, this study revealed students' *experiences of group work* (i.e., facilitating or hampering positive/negative experiences), which is in line with the previous studies on students' experiences of working in groups (Cantwell and Andrews, 2002; Underwood, 2003; Peterson and Miller, 2004; Hansen, 2006; Hammar Chiriac and Granström, 2012; Hammar Chiriac and Hempel, 2013). Group composition, group structure, ways of working, and participants' contributions are aspects put forward by the university students as either facilitating or hampering the positive experience of group work (Underwood, 2003; Peterson and Miller, 2004; Hansen, 2006; Hammar Chiriac and Granström, 2012; Hammar Chiriac and Hempel, 2013).

Several of the aspects bear reference to whether the group members work *in a group* or *as a group* (Underwood, 2003; Hammar Chiriac and Granström, 2012). Working as a group is characterized by common effort, utilization of the group's competence, and includes problem solving and reflection. All group members are involved in and working on a common task to produce a joint outcome (Bennet and Dunne, 1992; Galton and Williamson, 1992;

Webb and Palincsar, 1996; Hammar Chiriac, 2011a,b). According to the results, not all groups are working as a group but rather working in a group, which, according to Granström (2006), is common in an educational setting.

Due to problems with group composition, members' contributions, and group structure, including rules and ways of cooperation, some students end up with negative experiences of group work. Additionally, the university students allude to the fact that a well-functioning supportive study-social context is an essential prerequisite not only for positive experiences of group work, but also for learning (Hammar Chiriac and Hempel, 2013). Both working in a group and working as group might be useful in different parts of the group work (Hammar Chiriac, 2008) and cause learning. Hence working in a group causes cooperative learning based on social facilitation (Zajonc, 1980; Baron, 1986; Uziel, 2007) while working as group causes learning benefits through collaboration with other group members. Although both approaches might cause positive or negative experiences, a conceivable interpretation is that working as a group has a greater potential to enhance positive experiences. The findings suggest a need for further research to fully understand why some group work causes positive experiences and other instances of group work cause negative experiences.

The findings in the current study develop the findings from Hammar Chiriac and Einarsson (2007). First, it shows that it is possible to assemble all groups in to a joint research group (see below). Second, a thorough reanalysis, using an inductive qualitative content analysis, resulted in the emergence of three different abstractions: learning, study-social function, and organizations as either facilitating or hampering learning, and experiences.

METHODOLOGICAL CONSIDERATIONS

There are some limitations in the current study and most of them have to do with the construction of the study-specific, semi-structured questionnaire. First, the questions do not discriminate between (a) the type of group work, (b) the purpose with the group work, (c) the structure of the group work (i.e., extent and/or time); or (d) ways of working in the group (i.e., cooperation or collaboration). Second, the design of the questionnaire does not facilitate comparison between the populations included in the group. The questionnaire treated group work as one activity and did not acknowledge that group work can serve different functions and include various activities (Hammar Chiriac, 2008). This simplification of the phenomena group work causes criticism concerning whether or not it is possible to assemble these populations into a joint research group. An elaborated description of the analysis process and the comparison to three background variables has been used to counter this criticism. The thin results from the comparison, indicate that based on the question used in the study-specific questionnaire, it is possible to assemble the results into a corpus of joint results.

CONCLUSION/CONCLUDING REMARKS

The results indicate that most of the students' experienced that group work facilitated learning, especially concerning academic knowledge. Three important prerequisites (learning, study-social function, and organization) for group work that serve as an effective pedagogy and as an incentive for learning were identified and discussed. All three abstractions either facilitated or hampered university students' learning, as well as their experiences of group work. By listening to the university students' voices and elucidating their experiences and conceptions, we have been able to add new knowledge and understanding of what the essence is behind successful group work in higher education. Furthermore, the students' explanations of why some group work results in positive experiences and learning, while in other cases, the result is the opposite, can be of use for further development of group work as a pedagogical practice.

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REFERENCES

American Psychological Association (APA). (2002). *The Ethical Principles of Psychologists and Code of Conduct*. Available at: http://www.apa.org/ethics/code2002.html

Baines, E., Blatchford, P., and Chowne, A. (2007). Improving the effectiveness of collaborative group work in primary schools: effects on science attainment. *Br. Educ. Res. J.* 33, 663–680. doi: 10.1080/01411920701582231

Barett, M. (2007). "Practical and ethical issues in planning research," in *Research Methods in Psychology*, eds G. Breakell, S. Hammond, C. Fife-Schaw, and J. A. Smith (London: Sage Publications), 24–48.

Baron, R. S. (1986). Distraction-conflict theory: progress and problems. *Adv. Exp. Soc. Psychol.* 19, 1–40. doi: 10.1016/S0065-2601(08)60211-7

Bennet, N., and Dunne, E. (1992). *Managing Classroom Groups*. Hemel Hempstead: Simon & Schuster Education.

Blatchford, P., Kutnick, P., Baines, E., and Galton, M. (2003). Toward a social pedagogy of classroom group work. *Int. J. Educ. Res.* 39, 153–172. doi: 10.1016/S0883-0355(03)00078-8

Breakwell, G. M., and Hammond, F., Fife-Schaw, C., and Smith, J. A. (eds). (2006). *Research Methods in Psychology*. London: Sage Publications.

British Psychology Society (BPS). (2004). *Code of Conduct, Ethical Principles, and Guidelines*. Available at: http://www.bps.org.uk/document-download-area/document-download$.cfm?file_uuid=6D0645CC-7E96-C67F-D75E2648E5580115&ext=pdf

British Psychology Society (BPS). (2006). *Code of Ethics and Conduct*. Available at: http://www.bps.org.uk/the-society/code-of-conduct/code-of-conduct_home.cfm

Bryman, A. (2012). *Social Research Methods*. Oxford: University Press.

Cantwell, R. H., and Andrews, B. (2002). Cognitive and psychological factors underlying secondary school students' feeling towards group work. *Educ. Psychol.* 22, 75–91. doi: 10.1080/01443410120101260

Elo, S., and Kyngäs, H. (2007). The qualitative content analysis process. *J. Adv. Nurs.* 62, 107–115. doi: 10.1111/j.1365-2648.2007.04569.x

Galton, M., and Williamson, J. (1992). *Group Work in the Primary Classroom*. London: Routledge.

Galton, M. J., Hargreaves, L., and Pell, T. (2009). Group work and whole-class teaching with 11–14-years-old compared. *Cambridge J. Educ.* 39, 119–147. doi: 10.1080/03057640802701994

Gillies, R. M. (2003a). The behaviours, interactions, and perceptions of junior high school students during small-group learning. *J. Educ. Psychol.* 95, 137–147. doi: 10.1037/0022-0663.95.1.137

Gillies, R. M. (2003b). Structuring cooperative group work in classrooms. *Int. J. Educ. Res.* 39, 35–49. doi: 10.1016/S0883-0355(03)00072-7

Gillies, R. M., and Boyle, M. (2010). Teachers' reflections on cooperative learning: Issues of implementation. *Teach. Teach. Educ.* 26, 933–940. doi: 10.1016/j.tate.2009.10.034

Gillies, R. M., and Boyle, M. (2011). Teachers' reflections on cooperative learning (CL): a two-year follow-up. *Teach. Educ.* 1, 63–78. doi: 10.1080/10476210.2010.538045

Graneheim, U. H., and Lundman, B. (2003). Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Educ. Today* 24, 105–112. doi: 10.1016/j.nedt.2003.10.001

Granström, K. (2006). "Group phenomena and classroom management in Sweden," in *Handbook of Classroom Management: Research, Practice, and Contemporary Issues*, eds C. M. Evertson and C. S. Weinstein (Mahwah, NJ: Lawrence Erlbaum), 1141–1160.

Hammar Chiriac, E. (2008). A scheme for understanding group processes in problem-based learning. *High. Educ.* 55, 505–518. doi: 10.1007/s10734-007-9071-7

Hammar Chiriac, E. (2010). "Group work is not one, but a great many processes – understanding group work dynamics," in *Group Theory: Classes, Representation and Connections, and Applications*, ed. C. W. Danellis (New York: Nova Science Publishers, Inc.), 153–166.

Hammar Chiriac, E. (2011a). *Research on Group Work in Education*. New York: Nova Science Publishers, Inc.

Hammar Chiriac, E. (2011b). "Research on group work in education," in *Emerging Issues in Compulsory Education [Progress in Education. Volume 20*], ed R. Nata (New York: Nova Science Publishers, Inc.), 25–44.

Hammar Chiriac, E., and Einarsson, C. (2007). "Is the grass greener in the other group? Students' experiences of group-work" ["Är gräset grönare i den andra gruppen? Studenters erfarenheter av grupparbete"] [Published in Swedish], in Interaction on the Edge 2. *Proceedings from the 5th GRASP Conference*, ed. J. Näslund (Linköping: Linköping University).

Hammar Chiriac, E., and Granström, K. (2012). Teachers' leadership and students' experience of group work. *Teach. Teach. Theor. Pract.* 3, 345–363. doi: 10.1080/13540602.2012.629842

Hammar Chiriac, E., and Hempel, A. (2013), *Handbook for Group Work [Published in Swedish: Handbok för grupparbete – att skapa fungerande grupper i undervisningen]*. Lund: Studentlitteratur.

Hansen, R. S. (2006). Benefits and problems with student teams: suggestions for improving team projects. *J. Educ. Bus.* 82, 11–19. doi: 10.3200/JOEB.82.1.11-19

Johnson, D. W., and Johnson, R. T. (1975). *Learning Together and Alone. Cooperative, Competitive and Individualistic Learning* (Englewood Cliffs, NJ: Prentice Hall).

Johnson, D. W., and Johnson, R. T. (2004). *Assessing Students in Groups: Promoting Group Responsibility and Individual Accountability*. Thousand Oaks: Sage.

Kutnick, P., and Beredondini, L. (2009). Can the enhancement of group work in classrooms provide a basis for effective communication in support of school-based cognitive achievement in classrooms of young learners? *Cambridge J. Educ.* 39, 71–94. doi: 10.1080/03057640902836880

Lou, Y., Abrami, P. C., Spence, J. C., Poulsen, C., Chambers, B., and d'Apllonia, S. (1996). Within-class grouping: a meta analysis. *Rev. Educ. Res.* 66, 423–458. doi: 10.3102/00346543066004423

Mayring, P. (2000). *Qualitative Content Analysis. Forum: Qualitative Social Research 1:2.* Available at: http://qualitative-research.net/fqs/fqs-e/2-00inhalt-e.htm_140309

Näslund, J. (2013). "Pupils' and students' view on group work" [Published in Swedish: Elevers och studenters syn på grupparbete] in *Handbook for Group Work [Published in Swedish: Handbok för grupparbete – att skapa fungerande grupper i undervisningen]*, eds E. Hammar Chiriac and A. Hempel (Lund: Studentlitteratur), 233–242.

Peterson, S, and Miller, J. A. (2004). Quality of college students' experiences during cooperative learning. *Soc. Psychol. Learn.* 7, 161–183.

Underwood, J. D. M. (2003). Student attitudes towards socially acceptable and unacceptable group working practices. *Br. J. Psychol.* 94, 319–337. doi: 10.1348/000712603767876253

Uziel, L. (2007). Individual differences in the social facilitation effect: a review and meta-analysis. *J. Res. Person.* 41, 579–601. doi: 10.1016/j.jrp.2006.06.008

Webb, N. M., and Palincsar, A. S. (1996). "Group processes in the classroom," in *Handbook of Educational Psychology*, eds D. C. Berliner and R. C. Calfee (New York: Macmillan), 841–873.

Zajonc, R. B. (1980). "Compresence," in *Psychology of Group Influence*, ed. P. B. Paulus (New York, NY: Lawrence Erlbaum), 35–60.

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Creating learner-centered assessment strategies for promoting greater student retention and class participation

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Many teachers still use in-class multiple choice exams in their classes, the primary goal of which is to see how much the students have already learned. The assessment strategies we will examine in this paper change the focus from assessing *whether* students have learned anything to creating assessments which double as learning experiences themselves. Assessments do not have to merely measure *what* was learned; rather, they can be methods for getting students to learn while they are completing the task you have given them. The theoretical framework of learner-centered assessment emphasizes problem solving, higher order thinking skills, the promotion of a sense of ownership in learning, and a dialogic approach to instruction (Rich, 2011).

The purpose of this paper is to discuss six specific strategies for implementing learner-centered assessment in the classroom.

The six research based strategies we will discuss are:

- Strategies which ensure students have read the material
- The use of take-home examinations
- Giving short answer tests with questions at an integrative and/or applied level on Bloom's taxonomy
- Using Formative summative assessments during class time (FSA)
- Being responsive to results from Audience response systems (ARS)
- Student learning style inventories

The students have to read the material to learn anything from it!

A key to effective teaching is to ensure that students have read all the material. If the student doesn't read the material they will not be as ready to understand what is going on when the teacher covers the work in class (Krashen, 2004). As an instructor, breaking up the material may be beneficial because many students just breeze through the chapter instead of actually reading it. If teachers ask a question about the assigned reading at the beginning of the first class when that information will be discussed, and students are informed that there will be an in-class quiz on the reading, more students will do the reading (Sweet et al., 1998). If your students persist on ignoring their assigned readings, according to Felder and Silverman (1988) and Lucas and Bernstein (2004), there is not much point in punishing them. The students who fail to read will then be punished enough on examinations and quizzes.

TAKE-HOME EXAMS

Despite the common perception that take-home examinations are "giveaways" by teachers with low expectations, some research (e.g., Rich, 2011) demonstrates that the process of preparing a submission for a take-home test, can produce longer retention of material than studying for in-class examinations. When a student is answering items on a take-home exam, the student will often review the textbook and notes more frequently than they would have if they studied for a more traditional exam. Additionally, students are more likely to work in group study sessions, summarize material in their own words, and ask questions in class. While the student thinks that she/he is getting a break, in reality, she/he is learning while completing the test and being encouraged to take the work seriously. In a study by Weber et al. (1983), scores on knowledge items were significantly higher on take-home tests, a result attributed partially to the additional time students spent looking up answers.

Take-home tests help increase student knowledge about the information that will be covered in class by providing a base of pre-existing knowledge to which lectures and class activities can attach themselves. Students also have additional time to complete the assessment and therefore, they are not rushing through the test like they may be with an in-class examination, thereby reducing the level of student test anxiety. According to Rich (2011), giving students work to take home can reduce test anxiety, incentivize students to work collaboratively and elicit study habits that are at a deeper level. In his experiment on take-home examinations and retention, students indicated that when they were given tests to complete out of class, they learned more and studied harder.

SHORT ANSWER TESTS

Short answer questions give students a better chance to explain their thinking behind an answer than multiple-choice questions do (Tamir, 1990) and promotes more in-depth studying as students must be able to think conceptually to do well (Balch, 2007). Short answer questions can cover a wider range of content than a multiple choice item, and also allow for the teacher to demand integration of themes and ideas from the students. Short answer questions reduce the possibility of guessing. Further, when grading these examinations, teachers can see or understand the point the student was trying to make, as opposed to multiple choice tests where there is only one right answer. This proposition is supported by research which indicates that more difficult tests promote greater

learning than simpler tests (Gay, 2005). In a study by Balch (2007), students who were expecting a short-answer test performed better on definition questions in a multiple choice test than did students expecting a multiple-choice test. Balch suggested that the study practices that students use with short-answer examinations involve elaboration, rather than merely an attempt to recall, which promotes performance on more difficult test questions and deeper understanding of material.

FORMATIVE SUMMATIVE ASSESSMENTS (FSA)

Wininger defined formative summative assessment as "the measurement of student progress before or during instruction for the expressed purpose of modifying instruction and improving student performance by going over exams in class with students and garnering both quantitative and qualitative feedback from the students about their comprehension" (2005, p. 164) Formative summative assessments (FSA) are a way for you and the student to communicate and help them gain a better understanding of the material. FSA's inform both teachers and students about student perception and allow timely adjustments to be made. FSA's are done to improve student understanding and the quality of teaching by providing feedback for both the teacher and the student about learning progress with the goal of improving both instruction and learning (Wininger, 2005). As we are teaching, we can use FSAs to find out how well students comprehend the instruction (Harlen and James, 1997). One example of an FSA is reviewing practice examinations and answering questions about items on which many students are confused, or identifying questions these students may have about the material before the real examination is administered. Some instructors will give practice exams that check on student knowledge, and then use statistical analysis of those practice exams to reiterate or re-explain information that students are finding difficult (Black, 1993).

In an article by Wininger (2005), a teacher examined the use of one FSA method—namely, a review of questions and explanations of correct answers after students had already taken their first examination. In his study the teacher gave two of his classes the same examination. After the examinations were returned he used the FSA method for Class A allowing the students to review and ask questions to help them obtain a better understanding of key concepts covered in the exam, while Class B did not receive any review of the examination. One week later the classes were given the same exam for extra credit to see whether the class who was given the exam review would score higher than the class who did not receive the examination review. In the results, Wininger found that there were no significant differences between the two classes on the initial exam administration. However, students who received the FSA method scored significantly higher on the retake. Students exposed to the FSA method demonstrated an improvement of almost 10% in their test scores, whereas scores for students in the control group improved by only 2%. The results of this study support the effectiveness of the FSA method with regard to student comprehension.

AUDIENCE RESPONSE SYSTEMS (ARS)

According to Cain and Robinson (2008, p. 1), "Audience response systems are an increasingly popular tool in higher education for promoting interactivity, gathering feedback, pre-assessing knowledge, and assessing students' understanding of lecture concepts." Audience response systems (ARS) can give students a chance to evaluate what they have learned and how beneficial they felt each lesson was to them. There is an increased motivation to be engaged in the lesson when students get the chance to participate in ARSs (Doucet et al., 2009). It is important that teachers find ways for students to engage in lessons in order for the students to be able to get a chance to give their feedback on what they were taught. Once given this feedback the teacher can then alter the plan of instruction or students can work out misunderstandings with their peers or classroom discussion. According to an article by Stowell and Nelson (2007), increasing student participation is one of many strategies that could lead to improved student learning. To increase student participation, instructors can use "active student responding" methods. Using clickers, or giving student the ability to text answers to questions through a website like www.pollanywhere.com can help gain more feedback from more students, because their responses will be anonymous (Dallimore et al., 2010).

MAKING INSTRUCTION AND ASSESSMENT RESPONSIVE TO STUDENT LEARNING STYLE DIFFERENCES

Some research suggests that helping students and being aware of their learning styles can help them develop better study habits. Teachers can also benefit from information about their students learning styles by incorporating the learning styles of their students into lesson plans (Charkins et al., 1985). This may be done by placing students in learning situations with other students whose learning strengths are different from their own which allows them to practice skills in areas that are opposite to their current strengths (Pashler et al., 2008). As a result, teachers who create multiple forms of assessment to match learning styles may facilitate student performance at their level of competence by removing barriers that uncomfortable test formats can create. Some of the learning styles which have been identified are: auditory (learning best through hearing), visual (learning best through seeing), and kinesthetic (learning best when concepts are more hands-on).

Although most people use a mixture of all three learning styles there is a broad belief among educational researchers that they usually have a clear fondness for one (Kolb, 1984; Leite et al., 2010; see also the implications behind Fleming et al., 2011). Knowing and understanding the types of learning styles is important for students. To find out what your learning style is, you may use an index of learning styles questionnaire like the one at http://www.engr.ncsu.edu/learningstyles/ilsweb.phpl (Soloman and Felder, 1993). Participants will be asked a series of questions to which they will respond. At the end the results of the questionnaire will show which style of learning best fits the participant and which styles fit the least. Once students discover their learning style it can become much easier for studying and less stressful when it comes to homework because students are now aware of what methods of learning are optimal for themselves as

individuals (Felder and Silverman, 1988). For example, if you know that you are more of a visual learner, one who prefers graphs and pictures, as opposed to a verbal learner, one who prefers to hear or read information, when looking for directions, you know you are more likely to be successful by looking at a map as opposed to hearing someone give you directions.

Presenting course material that reflects each of the six learning strategies above can help to elicit deeper approaches to learning than standard learning strategies which focus solely on memorization and isolated facts. In particular, the use of learner-centered assessment methods can encourage students to connect new material to previously learned concepts, and/or apply them to real life. For a more in-depth discussion of surface and deep processing, see Chin and Brown (2000).

In conclusion, the use of learner-centered assessment methods can produce more effective instruction, deeper study strategies, and longer-term retention of material than the more traditional methods. Specifically, teachers are encouraged to implement one or more of the strategies discussed in this paper; namely, short quizzes before important readings, take-home examinations, short answer essays, Formative Summative Assessments, student learning style inventories, and ARS.

One way to conceptualize how these strategies might work together would be to first have each student identify his/her learning style, so that the students and their instructor might become knowledgeable about the strengths and weaknesses present in the class. Knowing about the student learning styles that are represented in a class will allow an instructor to create groups that may be more effective, because they have more diverse skillsets. Students can use the knowledge of their strengths and weaknesses to use study strategies which capitalize on the approaches which will lead them to the best outcomes.

After an instructor has gathered the information about learning styles from his/her students, s/he can now engage with the other strategies in this paper in a way that is conversant with that information. Alternate methods for completing homework assignments or assessments can be devised. ARS can be infused into instruction, to allow all students the chance to demonstrate understanding or raise questions. In so doing, the instructor can communicate a genuine interest in student learning, and continually seek improvement in the art of teaching.

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REFERENCES

Balch, W. R. (2007). Effects of test expectation on multiple-choice performance and subjective ratings. *Teach. Psychol.* 34, 219–225. doi: 10.1080/00986280701700094

Black, P. (1993). Formative and summative assessment by teachers. *Stud. Sci. Educ.* 21, 49–97. doi: 10.1080/03057269308560014

Cain, J., and Robinson, E. (2008). A primer on audience response systems: current applications and future considerations. *Am. J. Pharm. Educ.* 72, 1–6. doi: 10.5688/aj720477

Charkins, R. J., O'Toole, D. M., and Wetzel, J. N. (1985). Linking teacher and student learning styles with student achievement and attitudes. *J. Econ. Educ.* 16, 111–120. doi: 10.2307/1182513

Chin, C., and Brown, D. E. (2000). Learning in science: a comparison of deep and surface approaches. *J. Res. Sci. Teach.* 37, 109–138. doi: 10.1002/(SICI)1098-2736(200002)37:2<109::AID-TEA3>3.0.CO;2-7

Dallimore, E., Hertenstein, J., and Platt, M. (2010). Class participation in accounting courses: factors that affect student comfort and learning. *Issues Account. Educ.* 25, 613–629. doi: 10.2308/iace.2010.25.4.613

Doucet, M., Vrins, A., and Harvey, D. (2009). Effect of using an audience response system on learning environment, motivation and long-term retention, during case-discussions in a large group of undergraduate veterinary clinical pharmacology students. *Med. Teach.* 31, 570–579. doi: 10.3109/01421590903193539

Felder, R. M., and Silverman, L. K. (1988). Learning and teaching styles in engineering education. *Eng. Educ.* 78, 674–681.

Fleming, S., McKee, G., and Huntley-Moore, S. (2011). Undergraduate nursing students' learning styles: a longitudinal study. *Nurse Educ. Today* 31, 444–449. doi: 10.1016/j.nedt.2010.08.005

Gay, L. R. (2005). The comparative effects of multiple–choice versus short–answer tests on retention. *J. Educ. Meas.* 17, 45–50. doi: 10.1111/j.1745-3984.1980.tb00813.x

Harlen, W., and James, M. (1997). Assessment and learning: differences and relationships between formative and summative assessment. *Assess. Educ. Princ. Pol. Pract.* 4, 365–379.

Kolb, D. A. (1984). *Experiential Learning Experience as the Source of Learning and Development*. Englewood Cliffs, NJ: Prentice Hall.

Krashen, S. D. (2004). *The Power of Reading: Insights from the Research, 2nd Edn.* Westport, CT: Libraries Unlimited.

Leite, W. L., Svinick, M., and Shi, Y. (2010). Attempted validation of the scores of the VARK: learning styles inventory with multitrait-multimethod confirmatory factor analysis models. *Educ. Psychol. Meas.* 70, 323–339. doi: 10.1177/0013164409344507

Lucas, S. G., and Bernstein, D. A. (2004). *Teaching Psychology: A Step by Step Guide*. Mahwah, NJ: Lawrence Erlbaum.

Pashler, H., McDaniel, M., Rohrer, D., and Bjork, R. (2008). Learning styles: concepts and evidence. *Psychol. Sci. Public Interest* 9, 105–119. doi: 10.1111/j.1539-6053.2009.01038.x

Rich, J. (2011). An experimental study of differences in study habits and long-term retention rates between take-home and in-class examinations. *Int. J. Univ. Teach. Faculty Dev.* 2, 1–10.

Soloman, B., and Felder, R. (1993). *Index of Learning Styles Questionnaire*. Available online at: http://www.engr.ncsu.edu/learningstyles/ilsweb.phpl

Stowell, J. R., and Nelson, J. M. (2007). Benefits of electronic audience response systems on student participation, learning, and emotion. *Teach. Psychol.* 34, 253–258. doi: 10.1080/00986280701700391

Sweet, A. P., Guthrie, J. T., and Ng, M. M. (1998). Teacher perceptions and student reading motivation. *J. Educ. Psychol.* 90, 210–223. doi: 10.1037/0022-0663.90.2.210

Tamir, P. (1990). Justifying the selection of answers in multiple choice items. *Int. J. Sci. Educ.* 12, 563–573. doi: 10.1080/0950069900120508

Weber, L. J., McBee, J. K., and Krebs, J. E. (1983). Take home tests: an experimental study. *Res. High. Educ.* 18, 473–483. doi: 10.1007/BF00974810

Wininger, S. R. (2005). Using your test to teach: formative summative assessment. *Teach. Psychol.* 32, 164–166. doi: 10.1207/s15328023top3203_7

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Learning in friendship groups: developing students' conceptual understanding through social interaction

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The role that student friendship groups play in learning was investigated here. Employing a critical realist design, two focus groups on undergraduates were conducted to explore their experience of studying. Data from the "case-by-case" analysis suggested student-to-student friendships produced social contexts which facilitated conceptual understanding through discussion, explanation, and application to "real life" contemporary issues. However, the students did not conceive this as a learning experience or suggest the function of their friendships involved learning. These data therefore challenge the perspective that student groups in higher education are formed and regulated for the primary function of learning. Given these findings, further research is needed to assess the role student friendships play in developing disciplinary conceptual understanding.

Keywords: friendships, collaborative learning, student understanding, study groups

INTRODUCTION

There is an extensive literature conducted from a range of theoretical perspectives and methodologies on the role of groups and student learning in higher education (see Haggis, 2009; Lundberg, 2014). The concept of the "group" is heavily contested within this literature with discrepancies in the formation, structure, size, duration, and function (Baron and Kerr, 2003; Forsyth, 2009). Despite this, within higher education (HE) practice, characterizing the "group" has tended to be more clear-cut. Groups of students are often constructed within the parameters of a particular educational program by tutors to address an explicitly defined learning objective (see Boud et al., 2001). From this perspective, student groups tend to be small scale (e.g., 2–5 members), function within the confines of the classroom and achieve tasks through cooperative or collaborative learning (Bruffee, 1993). Cooperative learning involves students dividing roles and responsibilities between group members, so learning becomes an independent process and outcome. On the other hand, collaborative learning involves students working together by developing shared meanings and knowledge to solve a task or problem (Dillenbourg et al., 1996, Dillenbourg, 1999). From this perspective, learning is conceptualized as a social process but also one that ultimately results in an individual outcome. That is, collaborative learning may facilitate individual conceptual understanding and higher-order thinking (Gillies, 2000).

The above perspectives on group learning both assume that groups are formed within the confines of formal learning environments (e.g., lecture theaters), involve students on the same degree program and have the explicit function of achieving a learning task. However, we have previously shown that student groups also tend to form spontaneously outside of the lecture room without the intervention of a tutor (Senior et al., 2012; see also Havnes, 2008); but, their function tends to remain centered on achieving an agreed and defined outcome by group members (e.g., the completion of a learning task). In this light, groups may disband once the task is completed by group members (Davies, 2009). The findings from the current study show that students use existing social networks such as friends as well as organized study groups as a mechanism for learning. Moreover, students may have used the social contexts in which they interacted with their friends outside of the classroom to further their understanding of disciplinary concepts in Psychology. However, the students did not conceive this to be a learning experience or suggest the function of their friendship groups involved learning. In this light, the current study suggests, in some contexts, students may not create, develop, and regulate groups for the function of learning as suggested in the literature (see Wenger, 1998; Borzillo and Probst, 2008; Orsmond et al., 2013) but use existing social groups as primae facie contexts in which to learn through social interaction. We refer to this as an "implicit community," where tasks or events are achieved collaboratively but there is no awareness of the actual learning process or the subsequent outcome. This paper is divided into four sections: (1) theoretical accounts of student learning and groups; (2) the role of friendship groups and student learning; (3) discussion of the focus group methodology informed by critical realism which was employed to explore the role between groups and student learning; (4) the extent to which friendship groups regulated student understanding of disciplinary concepts (cognitive accounts of learning) or facilitated the development of disciplinary identities (social accounts of learning).

STUDENT LEARNING AND GROUPS

Within the literature on student learning, cognitive approaches have tended to be the most influential with regard policy and practice (see Entwistle, 2001, 2009). From a cognitive perspective, learning is conceived in terms of information processing, achieved through the interplay of cognitive structures and processes (Marton and Pang, 2006). In this light, learning is construed as an individualistic outcome, best measured by the "depth" and "quality" of information processing. This underpins the

distinction between "surface" and "deep" approaches to learning (Marton and Säljö, 1976), which has historically had a significant impact on the way in which the student experience has been analyzed, measured, and discussed (Richardson, 1990; Webb, 1997). Moreover, a surface approach involves superficial processing of information, which is categorized by memorization, whereas a deep approach involves a deeper level processing of information, which is characterized by conceptual "understanding" (Entwistle, 2001).

Over recent years in HE both undergraduate and postgraduate programs have tended to be designed to provide opportunity for students to work collaboratively and even in some cases across national boundaries (Dolmans et al., 2001; Keay et al., 2014; Rienties et al., in press). Here, students tend to be organized into small scale "groups," which are designed to complete specific tasks that correspond to formalized learning objectives (Davies, 2009). This conceptualization of the "group" centers on Lewin's (1948) notion of "interdependence," where the success of individual group members is bound to the success of the group completing the task. The concept of the "group" in this context follows a stage driven approach, which is often employed in organizational settings (Reid and Hammersley, 2000). That is, the group forms for the purpose of completing a task, roles are assigned to group members, norms are established and the group disbands once its aim has been achieved (see Tuckman, 1965; Baron and Kerr, 2003). Within this framework, groups may employ principles from cooperative learning, where each member has a distinct role and largely works independently to achieve a task. Whereas, collaborative learning involves students working together, so roles may become interdependent or blurred (Bruffee, 1993). However, within these groups the emphasis is on the role of the course tutor who is central to the group development and hence its success as a potential learning device (Boud, 2001; Lancaster and Strand, 2001; Curseu and Pluut, 2013).

The evidence on the relationship between student groups and learning is encouraging from a pedagogic perspective. Barton et al. (2005) found students working in groups were more likely to score higher on an "openness to experience" scale that is significantly associated with a deep approach to learning (Zhang, 2003) compared to students who studied alone. Additional support was revealed by our previous work where it was found that students who completed a coursework task in a group significantly achieved a higher grade than students who completed a coursework task alone (Senior et al., 2012). The benefits of group work are such that it promotes "active" learning characterized by students engaging with a learning task and the development of wide portfolio of critical thinking skills (Gokhale, 1995). Group work may also increase students' self-efficacy and motivation (Davies, 2009). Whilst the experience of working in groups may facilitate conceptual understanding, it additionally provides an opportunity to develop inter-personal skills which in turn may lead to an improvement in subsequent employability (Senior and Cubbidge, 2010; Senior et al., 2014) or as Mello (1993) argues, prepares students for the "real world" with the opportunity to develop social skills that are very likely to be required after graduation (see also Tymon, 2013).

Unfortunately student experiences working within such learning groups are not universally positive and some do report negative experiences. Those students who do not readily perceive the benefit of group work may not engage and subsequently interact with other group members (Walker, 2001). In turn, this may lead to negative outcomes such as "free riding" where some group members benefit from the accomplishments of others in the group but they do not contribute themselves (Salomon and Globerson, 1989). In the context of higher education, collectively a group may score high during an assessment designed to measure conceptual understanding but at an individual level "free riders" within that group may not understand the intended concept. This is problematic as this may produce a "sucker effect" where other group members respond to "free riding" by also becoming "free riders" themselves. Here, group work in HE may actually inhibit individual student conceptual development, which would require course tutors to carefully manage, design, and assess groups effectively.

Overall, from a cognitive perspective of learning, there is a literature that suggests working collaboratively may facilitate quality "individual" learning, which involves conceptual understanding. However, these groups tend to be organized by course tutors, have a distinct function on completing a specified learning task and disband once this is achieved. In light of this, it remains to be seen whether or not learning can occur in other forms of groups between students? One such social group that is ubiquitous throughout the HE sector are friendship groups.

THE IMPORTANCE OF FRIENDSHIP GROUPS IN LEARNING

Early work has shown that friendship groups play an influential and significant role in the student life cycle (Spady, 1970). Students have been shown to use such social activity to develop cooperative learning strategies across a range of different classroom settings and while not all lead to equally effective strategies in learning most if not all such strategies are related to the development of a portfolio of transferable skills such as self esteem or the ability to work well with others (Slavin, 1988). This social skillset has been shown to play an effective mechanism in the facilitation of learning across a diverse student population (Hurtado et al., 2003). Interestingly there is an emerging body of evidence suggesting that the development of such learning strategies is also predicated by engaging within a friendship group on various social media platforms (Dabbagh and Kitsantas, 2012; Wang et al., 2012) which suggests that designers of distance learning provision should consider opportunities for students to engage with such activities as part of the online learning experience.

Within an HE setting and during the course of a campus based degree program students are likely to form and develop many diverse friendships with their peers on both their course and in the wider student community. According to Hartup and Stevens (1997, p. 355):

> *"Friendship consists mainly of being attracted to someone who is attracted in return, with parity governing the social exchanges between the individuals involved. Friendships carry expectations that "best" friends will*

spend more time with one another than other persons, offering one another emotional support, including loyalty, trust, intimacy, and fun."

In light of the above quote, friendship groups may develop between students based on some form of mutual attraction, for example interests and even political values. Students may also form friendships with other students on their course for a variety of reasons including an interest in the discipline they are studying. Given the almost universal and pervasive nature of the friendship group within the student population it is incumbent on us to examine its utility, if any, as a potential learning device. The research literature with young children does suggest friendship groups positively impact on cognitive, emotional, and social development (Hartup, 1989) and aid psychological and affective adjustment to formal educational environments (Berndt, 1999). However, Antonio (2001) argues despite the growing literature on peer-to-peer interactions in HE, their still remains a need for research on the role of friendship groups within universities. The large-scale survey study conducted by the author above ($n = 677$) suggested that racially diverse student friendship groups were related to high levels of cultural awareness, racial understanding, and interracial interactions. Whilst this demonstrates the role between friendship groups and human relations, there still remains a lack of evidence on student learning. Nonetheless, Roberts (2009) conducted an ethnographic study of an undergraduate nursing program and found that friendship groups were used by students as a support mechanism where they could "ask anything" to develop their own understanding. This finding suggests that students who were categorized as friends were seen as a valuable source of knowledge, which was not subject to a hierarchical structure based on seniority or time served on the educational program. On the other hand, Antonio (2004) found students tended to use friends on their program of study as a "referral" point to judge their own academic competency. That is to say, friendship groups may be used by individual students as a mechanism to regulate their "academic self concept," which refers to a student's perceived academic ability (Rodriguez, 2009).

This process of social comparison may therefore impact on how students interact with their peers and their motivation to learn, which is associated with understanding of concepts (Entwistle and Waterston, 1988; Kahu, 2013; Mega et al., 2014). In this light, existing friendship groups between students do indeed impact on students learning. However, as noted above, while such groups are effective in ensuring that students do develop an "academic self concept" they are limited insofar as they suffer from the same constraints as the more formal tutor developed work groups, e.g., they tend to be defined for a specific purpose and will cease to function after their objectives have been met. However, while work has started to show that spontaneous friendship groups do indeed play an important role in the development of work based learning (Carr and Gidman, 2012) their efficacy within the HE sector and student learning has yet to be examined. The current research was therefore conducted as an exploratory study investigating the extent to which existing friendships between students may impact learning. These data would therefore provide an insight in whether learning in groups (such as friendships) can exist when the function of the group is not explicitly centered on completing a learning task and what this involves.

METHODOLOGY

Two focus groups each lasting approximately one hour were conducted with seven first year students (for each focus group participants were split into a group of three or four, age range 18–20 years, five females and two males) enrolled on a Human Psychology degree at a UK higher education institution. Participants were randomly selected from a cohort of approximately 150 students. All procedures were approved by the local institutional ethics review board and all of the participants provided written informed consent prior to taking part in the focus groups. The sample size was deemed appropriate for the current study as it is consistent with the critical realist assumptions that underpin this study (see Parker, 1992) and with existing work in the field (e.g., Sims-Schouten et al., 2007; Easton, 2010).

The focus group schedule aimed to gather data on the students' perceptions and experiences of learning. As the role of the researcher is one of a "moderator" or "facilitator" (Kidd and Parshall, 2000), there were three broad topics that were raised for group discussion: (1) What does a typical day at university involve? (2) What do you normally do outside of lectures and seminars? (3) What does learning mean to you and how do you know when you have learned something? In line with the principles of qualitative methods in psychological research it was important to use probing questions rather than specific leading questions on the role of friendship groups, as these may have shaped the responses of the participants in a socially desirable manner (see Willig, 2013). By using probing topics, this allowed the participants to draw upon their own lived experiences and discuss what was important and relevant to them (see Banister et al., 2011). Nonetheless, to ensure the focus groups addressed the role between student social interactions and learning, there were a series of prompts (i.e., What do you talk about with other students from university? Do you meet other students outside of university? What do you do together?) to direct the discussion.

Each focus group was conducted by one of the authors who had not taught the students or had any contact with the students prior to data collection, therefore minimizing social desirability artifacts. Data collection commenced during the final semester of the academic year, providing students with the opportunity to discuss the range of teaching methods, assessment, feedback, learning environments, and strategies experienced during the course of their studies.

The focus group data were transcribed by a research assistant and analyzed by the authors from a critical realist perspective. The key principles of critical realism are the existence of a real world which is multi-layered (ontology) produced by underlying causal mechanisms (epistemology; Bhaskar, 1975, 1979; Pawson, 1989). That is to say, mechanisms produce phenomena, which can then be experienced. Given this, as underlying mechanisms are unobservable due to the multi-stratified nature of reality, they can be inferred by exploring the similarities and differences in how people construct and add meaning to their experience of phenomena (Downward and Mearman, 2007). In this case,

it is the experience of learning in groups during a first year Human Psychology undergraduate degree program. Despite this, the causal efficiency of a mechanism is regulated by a context (Lawson, 1997). Whilst mechanisms have the causal potential to produce phenomena; this may not be actualized within and across contexts. Within any educational context (e.g., lecture, seminar etc) there are likely to be a range of causal mechanisms that co-exist. This refers to an "open system" as the causal efficacy of a mechanism may be inhibited or actualized by other mechanisms within that context (Pawson, 1989; Sayer, 2000). In this light, research from a critical realist perspective becomes the process of inferring the causal mechanism(s) that may have produced the phenomenon under investigation and the contextual conditions in which these structures were realized. The emphasis is on the process of "inferring" mechanisms as these underlying causal structures are assumed to be unobservable; therefore they cannot be directly identified. As Sims-Schouten et al. (2007, p. 105) argue:

> "*This means our attempts to identify and understand deep structures will remain just that – attempts. However, acknowledging that our knowledge of* ***reality*** *will always be limited is not the same as saying that there is no such thing as* ***reality****." [our bold]*

However, evidence collected during an empirical investigation on participants' experience of phenomena will draw upon the activity of mechanism(s), therefore aiding a researcher to make informed inferences and interpretations of causal mechanism(s). This process of inferring mechanisms is referred to as retroduction, which involves moving beyond description to underlying meaning (Pawson, 1989). In this light, inferred mechanism(s) borne from research data are more likely to be valid (i.e., correspond to actual mechanism\s) than those developed from anecdotal or lay perspectives (see Benton and Craib, 2001; Carter and New, 2004). Whilst this research was exploratory, the aim was to examine the extent to which learning in friendship groups (proposed mechanism) may have facilitated student understanding (phenomena) during a first year Human Psychology degree (context). This was achieved by employing a "case by case" critical realist analytical approach. The qualitative data coding involved the process of observing variation within and between responses to develop themes. In this light, themes were used to identify similarities and differences in how the students constructed their experience of learning in friendship groups (both in and outside formal learning environments – lectures). From these data, within the context of this exploratory study we address the extent to which learning in friendship groups might be a mechanism for student learning from a psychological perspective. To ensure quality, the themes presented in the analysis were scrutinized by an independent expert in relation to richness and interpretation of data, depth of analysis and overall coherence (Parker, 1992; Elliott et al., 1999).

ANALYSIS AND DISCUSSION

The first theme to emerge from the data was individual versus group learning. All the participants constructed learning as a cognitive outcome, which was best achieved through individualistic strategies to learn. Learning in the context of a group or with others was constructed as problematic because it prevented students from retaining facts. This is suggested in three extracts below:

> "*I learn best on my own, I do the same as you (refers to a participant) I just summarize what was said in a lecture and read over it and over it till it sticks.*"
>
> **Janet**[1]

> "*I think most of the time I study alone just because I prefer it like that, I think I would get less done in a group as discussion may stop me concentrating on learning the facts.*"
>
> **Dave**

> "*Personally I work best alone because I make a list of what I need to look at and tick it off one by one, make my notes and learn it, like I work best like that than trying to do it with other people, because then they can waste your time, like it's not a waste obviously you are helping someone but you can give up a lot of your time to teach someone something you already know...*"
>
> **Zara**

These data suggest that learning was conceived as an individualistic cognitive outcome. Moreover, for Janet in the first extract, learning was constructed as the memorization of teaching materials, so successful learning involved accurate recall of information. Consequently, as evidenced in the extract by Dave, groups are conceived as problematic as social interaction may prevent students from retaining facts and hence learning. These data therefore suggest that psychology, as a discipline, is perceived by the students in the focus groups as dealing with concrete "facts" rather than concepts that are subject to debate. In the extract by Zara, learning is constructed as the transmission of information or facts. Overall, this suggests that learning was construed primarily as an individualistic process and outcome to which group work does not provide a facilitative context for this. This conceptualization of learning is largely problematic and challenges the perspective of some higher education practitioners who argue that learning is concerned with change and transformation rather than imparting "facts" or "truths" to passive students (see Prilleltensky and Nelson, 2002).

The second theme to emerge from the focus group data was collaborative learning through friendship groups. All the participants discussed the ways in which they interacted with other students on their course who they categorized as friends. These interactions suggested that learning was a social process as friendships provided contexts for participants to regulate how they learned, what they learned and to judge their success as a learner. The three extracts below illustrate the range of interactions participants had with their friends on the course.

> "*...with my friends that are on my psychology course, I might have a discussion about...umm... whether we understand the stuff given from the lecture, we can then go through it together and have a discussion about it. Like I didn't really get that lecture, my friend will go yeah I didn't get it either. We have discussions and arguments about what has been said in lectures.*"
>
> **Louise**

> "*With my friends I talk about...um... lectures and then what we didn't understand and then we'd like each read up a section and then try and explain it to one another and like we did that with one of our lectures*

[1]All names reported throughout are pseudonyms.

and revising and stuff. I think that helps then because you know hearing from your friend is easier than hearing from someone you don't know."

Colin

"*Within the exam period I talk with my friends quite a lot actually, like how much revision have you done? Or I might say oh I've done some today, yesterday and vice versa especially in exam period time then you talk more about exams. Coursework is exactly the same, well with me like, the coursework date is coming up soon, so I will say what you done and vice versa...um... you kind of go through it with each other and check.*"

Sarah

The above extract by Sarah suggests that interactions with friends were utilized as "reference" points during assessments to regulate learning. In this context, learning was positioned as a quantifiable measure, which could be used to judge how successful a student was by the amount of time they engaged with a task (e.g., revision and coursework). This extract suggests that interactions between friends provide a benchmark or measure to regulate how much time students spend on a learning task. In the extracts by Louise and Colin there is the suggestion that learning is centered on understanding concepts where social interactions between friends are utilized as contexts to facilitate this process. For both these participants, when they had problems understanding concepts from lecture material, their friendships became a resource to help develop their understanding. As evidenced in the extract by Colin, this strategy involved interaction and discussion between friends as they were seen as non-judgmental. Nonetheless, the form of interaction discussed in this extract between friends supports the earlier theme on individual vs. group learning. That is, learning through social interaction involved the transmission of information as a purely individualistic process and outcome. Interestingly, none of the participants explicitly discussed (nor when prompted by the interviewer) the interactions with their friends on their course (like those identified above) as learning experiences. Despite this, as suggested in these data, friendships may be an important aspect for learning during the first year of a degree program. In the extract below, Janet discusses how friendships between herself and other students on her course were developed.

"*All my friends on the course live at home like me but If I have just met someone doing psychology and they are telling me something, I don't think I would listen but now I have been at unit for a long time and...umm... trust develops, so you become friends and then you can see how you can help each other and err, like helping with references. I wasn't good with referencing then my friend helped me and like he wasn't good at spelling and my other friend wasn't good at setting out paragraphs so were just helping each other out.*"

Janet

The extract above suggests friendships were formed based on some commonality between students, in this case where they lived during term time. Despite this, for Janet, trust was critical to developing her friendships with other students and was achieved through regular interactions. Likewise, without trust Janet felt unable to accept the perspectives of other students. Friends therefore provide a support network to facilitate academic development at an individual level. Whilst only one participant discussed the formation of friendships with other students on their course, the extract does suggest that these groups are not developed for the purpose of learning but they provide a context for learning to occur once they are formed. Five of the participants also discussed how existing friendships in the wider student community (that is, outside of their course) were used to develop their conceptual understanding. This is suggested in the two extracts below:

"*...there are a lot of guys in my friendship group like you know... umm... when they are sat playing call of duty (video game) or something I am like this is going to make you, you know have more aggression due to the media and stuff just kind of like you know like chucking topics out there like or like we, I don't know about you guys (refers to other participants), we did a lecture about nature versus nurture and media aggression and stuff like that it's interesting to chat about with your friends really if it's relevant to the modern day because friends not on my course will not know what I am on about but if you make it relevant to now then I can get a good discussion with my friends and see what they think and see if they are right.*"

Suzy

"*A couple of my friends were looking at a magazine and at the cover and images and things and I was saying like oh yeah about this and this, anorexia nervosa and this and they were like discussing with me. It was good to come up in conversation because I did this on my course and they were all listening and then talking about it. Also I have a friend who does optometry as well and she was talking about the vision in children and things and I joined in the conversation and she was like what are you doing this? I was like yep, yep I am learning this. It's quite amusing really; it is good we got discussing it and I was getting a different view and starting to see what it all means.*"

Zara

The two extracts above both suggest interactions between friends facilitated conceptual understanding through the discussion and application of disciplinary concepts. In the first extract, Suzy applies theories of aggression (which were discussed in a lecture) to her friends' "warfare" arcade game. This provides a learning experience, which enables Suzy through discussion with her friends to further her understanding of theoretical concepts by applying them to contemporary "real life" situations. The quality of this interaction therefore allowed her to add meaning and judge the validity of the theories involving aggression. In the second extract, Zara discusses two learning experiences with friends at University. The first involved discussion of eating disorders, whilst the second involved the visual perception of children. Interestingly, Zara makes reference to the fact that interacting with her friend who studied optometry provided a context in which she was given an insight into theories of vision from a different perspective (see e.g., Antonio, 2004). This experience provided scope for Zara to start to develop an interdisciplinary understanding of the concept of vision. However, integrating different disciplinary perspectives may not be valued across degree programs and may even have a negative relationship with student attainment. Nonetheless, these data are indicative of a deep approach to learning, characterized by an orientation to "understand" and extract "meaning" from a learning task (Entwistle, 2001). This finding therefore contrasts with the first theme, which suggested the participants tended to conceptualize learning in terms of memorization, which was often characterized as "retaining the facts."

These data therefore support the earlier argument that students did not view interactions with their friends as valid learning experiences, since learning was conceived in terms of retention and recall. This interpretation, however, remains tentative given the lack of data on how students explicitly discussed their conceptions of learning in relation to friendship groups. Despite this, the above extracts support the earlier argument that friendship groups were not formed based on the desire to achieve a learning objective but provided a context in which student understanding could be developed. However, these students did not necessarily demonstrate awareness that these interactions had a group function – conceptual development.

These data therefore provide evidence that existing friendships between students on a course and in the wider student community ("outside of the classroom") were a resource in which the participants developed their understanding of theoretical concepts through discussion, explanation, and application to "real life" contexts. In the context of the current study, friendships may therefore have been an active mechanism facilitating student conceptual understanding. This process of collaborative learning is best understood as an "implicit community," which refers to individuals achieving a task (in this context learning characterized as conceptual development) through social interaction but demonstrating no self-awareness. That is, people may feel that they are not part of a community or group but still achieve tasks by working collaboratively. This adds to the literature on groups (see Antonio, 2001, 2004; Baron and Kerr, 2003) by suggesting that groups may form and function through social interaction but membership may not be a conscious decision. Interestingly, all seven participants conceived learning as knowledge acquisition which involved retention and recall of course material. Furthermore, learning was perceived as "competitive" involving individualistic cognitive processes (retention strategies). Group work was therefore constructed as a problematic endeavor, as it prevented students from engaging in strategies to memorize facts (learn). This suggests the participants may not have seen the interactions they engaged with friends as valid learning experiences; we do, however, present this as a tentative interpretation of the findings given the lack of data directly addressing how students understood the relationship between friendship groups and learning.

The implications of the current research go beyond understanding the dynamics of student focused friendship groups as effective drivers of learning. The findings of the current study suggest that students may interact within such groups but not be immediately aware of the beneficial effect that such activity is having on their subsequent learning of various concepts. Such a finding would inform the current movement on the development of campus real estate that is designed to facilitate such social endeavors (Morrone and Workman, 2014). Initiatives such as the Primary Capital Program or the British Council for School Environments in the UK act as fora for innovation in the design of academic buildings for the tertiary education while initiatives such as the Learning Landscapes in Higher Education[2] is an example of the emerging role that Architects and Educationalists can share together in the HE sector. When considered together with the findings of the current study it is clear that the design of any campus estate needs to incorporate the opportunities for students to meet in a social and non-directed capacity.

It is also interesting to speculate that such a learning mechanism may be used to design effective distance delivery. Specifically, with the regards to the development of Massive Open Online Courses (MOOCs) which often consists of many thousands of students taking part simultaneously. With regards to the design of such programs there is much debate as to the various means to support various learning styles (Grunewald et al., 2013) and program designers are now turning their attentions to various mechanisms that may engender and support a more community based style of learning (Gillani et al., 2014).

The data revealed in the current paper suggest friendships were formed with other students due to some form of mutual attraction, which is consistent with the exiting literature (Hartup and Stevens, 1997). It is important to note this mutual attraction may be centered on some aspect of learning (conceptions of, study strategies, etc.) but the friendship itself was not necessarily formed to specifically facilitate learning. Nonetheless, trust was seen as central to developing friendships and producing contexts where the social interactions between friends stimulated conceptual development at an individual student level. In this sense, collaborative learning was evident as students developed shared meanings and understandings through social interaction, which demonstrates learning at both an individual and social level (see Gillies, 2000). As the study was exploratory, involving two focus groups with a sample of seven first year psychology students, these findings are presented tentatively but they do raise a number of research questions that warrant further investigation adopting a longitudinal design: (1) how do friendships form and develop over the course of a degree program? (2) How do students understand and make sense of their friendships groups in higher education? (3) Are there differences between subject areas? (4) To what extent does the social interaction between friends relate to student conceptual development over the course of a degree? (5) To what extent does the interaction between friends relate to the development of disciplinary professional identities over the course of a degree?

CONCLUSION

Within the context of this study, the focus group data suggested friendship groups may have been a causal mechanism for developing student conceptual understanding. Moreover, whilst students tended to conceive learning as an outcome involving memorization and perceived working in study groups as problematic (as it may prevent students from engaging in strategies to retain information), existing friendship groups provided a context to implicitly further students understanding of theoretical concepts. These friendships were not formed specifically to address a learning objective, which is often assumed from a psychological perspective but developed from some form of mutual attraction between students. The focus group data suggested that these friendship groups provided a setting in which trust was developed between students. Interactions between friends therefore created opportunities for students to explain disciplinary concepts, apply

[2]See http://www.rm.com/_RMVirtual/Media/Downloads/RM_PCP_White_Paper.pdf or http://www.bcse.uk.net/ or http://learninglandscapes.blogs.lincoln.ac.uk/files/2010/04/FinalReport.pdf for further information regarding these initiatives.

to "real life" situations and gain different perspectives, which may have facilitated conceptual understanding at an individual level. Given the study was exploratory, the findings were presented tentatively but they do suggest the importance of existing groups (not formed for the purpose or shared aim of learning) in developing student understanding. Future research therefore needs to address how friendships form, develop, and are understood by students over the course of a degree program along with the extent to which they produce a deeper conceptual understanding.

REFERENCES

Antonio, A. L. (2001). Diversity and the influence of friendship groups in college. *Rev. High. Educ.* 25, 63–89. doi: 10.1353/rhe.2001.0013

Antonio, A. L. (2004). The influence of friendship groups on intellectual self-confidence and educational aspirations in college. *J. High. Educ.* 75, 446–471. doi: 10.1353/jhe.2004.0019

Banister, P., Bunn, G., Burman, E., Daniels, J., Duckett, P., Goodley, D., et al. (2011). *Qualitative Methods in Psychology: A Research Guide*, 2nd Edn. Buckingham: Open University Press.

Baron, R. S., and Kerr, N. L. (2003). *Group Process, Group Decision, Group Action*. Maidenhead: Open University Press.

Barton, A., Van Duuren, M., and Haslam, P. (2005). Voluntary peer learning groups: do students utilise increased structure, and are there any hard gains? *Psychol. Learn. Teach.* 5, 146–152. doi: 10.2304/plat.2005.5.2.146

Benton, T., and Craib, I. (2001). *Philosophy of Social Science: Philosophical Issues in Social Thought*. New York: Palgrave Macmillan.

Berndt, T. J. (1999). Friends' influence on students' adjustment to school. *Educ. Psychol.* 34, 15–28. doi: 10.1207/s15326985ep3401_2

Bhaskar, R. (1975). *A Realist Theory of Science*. Brighton: Harvester Press.

Bhaskar, R. (1979). *The Possibility of Naturalism*. New York: Humanities Press.

Borzillo, S., and Probst, G. (2008). Why communities of practice succeed and why they fail. *Eur. Manage. J.* 26, 335–347. doi: 10.1016/j.emj.2008.05.003

Boud, D. (2001). "Making the move to peer learning," in *Peer Learning in Higher Education: Learning From and with Each Other*, eds D. Boud, R. Cohen, and J. Sampson (London: Kogan Page), 1–21.

Boud, D., Cohen, R., and Sampson, J. (2001). *Peer Learning in Higher Education*. London: Kogan Page.

Bruffee, K. (1993). *Collaborative Learning*. Baltimore, MD: Johns Hopkins University Press.

Carr, H., and Gidman, J. (2012). Juggling the dual practitioner and educator: practice teachers' perceptions. *Community Pract.* 85, 23–26.

Carter, B., and New, C. (2004). *Making Realism Work: Realist Social Theory and Empirical Research (Critical Realism-Interventions)*. London: Routledge.

Curseu, P. L., and Pluut, H. (2013). Student groups as learning entities: the effect of group diversity and teamwork quality on groups' cognitive complexity. *Stud. High. Educ.* 38, 87–103. doi: 10.1080/03075079.2011.565122

Dabbagh, N., and Kitsantas, A. (2012). Personal learning environments, social media, and self-regulated learning: a natural formula for connecting formal and informal learning. *Internet High. Educ.* 15, 3–8. doi: 10.1016/j.iheduc.2011.06.002

Davies, W. (2009). Group work as a form of assessment: common problems and recommended solutions. *High. Educ.* 58, 563–584. doi: 10.1007/s10734-009-9216-y

Dillenbourg, P. (1999). "What do you mean by 'collaborative learning'?" in *Collaborative Learning: Cognitive and Computational Approaches*, ed. P. Dillenbourg (Amsterdam: Pergamon, Elsevier Science), 1–16.

Dillenbourg, P., Baker, M., Blaye, A., and O'Malley, C. (1996). "The evolution of research on collaborative learning," in *Learning in Humans and Machines: Towards an Interdisciplinary Learning Science I*, eds P. Reimann and H. Spada (Oxford: Elsevier), 189–211.

Dolmans, D., Wolfagen, I., Van der Vleuten, C., and Wijnen, W. (2001). Solving problems with group work in problem based learning: hold on to the philosophy. *Med. Educ.* 35, 884–889. doi: 10.1046/j.1365-2923.2001.00915.x

Downward, P., and Mearman, A. (2007). Retroduction as mixed-methods triangulation in economic research: reorienting economics into social science. *Cambridge J. Econ.* 31, 77–99. doi: 10.1093/cje/bel009

Easton, G. (2010). Critical realism in case study research. *Ind. Mark. Manage.* 39, 118–128. doi: 10.1016/j.indmarman.2008.06.004

Elliott, R., Fischer, C. T., and Rennie, D. L. (1999). Evolving guidelines for publication of qualitative research studies in psychology and related fields. *Br. J. Clin. Psychol.* 38, 215–299. doi: 10.1348/014466599162782

Entwistle, N. J. (2001). Styles of learning and approaches to studying in higher education. *Kybernetes* 30, 593–602. doi: 10.1108/03684920110391823

Entwistle, N. J. (2009). *Teaching for Understanding at University: Deep Approaches and Distinctive Ways of Thinking*. Basingstoke: Palgrave Macmillan.

Entwistle, N., and Waterston, S. (1988). Approaches to studying and levels of processing in university students. *Br. J. Educ. Psychol.* 58, 258–265. doi: 10.1111/j.2044-8279.1988.tb00901.x

Forsyth, D. R. (2009). *Group Dynamics*. Belmont, CA: Wadsworth.

Gillies, R. M. (2000). The maintenance of collaborative and helping behaviours in collaborative groups. *Br. J. Educ. Psychol.* 70, 97–111. doi: 10.1348/000709900157994

Gokhale, A. (1995). Collaborative learning enhances critical thinking. *J. Technol. Educ.* 7, 22–23.

Grunewald, F., Meinel, C., Totschnig, M., and Willems, C. (2013). "Designing MOOCs for multiple learning styles," in *Scaling Up Learning for Sustained Impact* (Berlin Heidelberg: Springer), 371–382. doi: 10.1007/978-3-642-40814-4_29

Gillani, N., Eynon, R., Osbourne, M., Hjorth, I., and Roberts, S. (2014). Communication communities in MOOCs. Available online*: arXiv:*1403.4640v2

Haggis, T. (2009). What have we been thinking of? A critical overview of 40 years of student learning research in higher education. *Stud. High. Educ.* 34, 377–390. doi: 10.1080/03075070902771903

Hartup, W. W. (1989). Social relationships and their development significance. *Am. Psychol.* 44, 120–126. doi: 10.1037/0003-066X.44.2.120

Hartup, W. W., and Stevens, N. (1997). Friendship and adaptation in the life course. *Psychol. Bull.* 121, 355–370. doi: 10.1037/0033-2909.121.3.355

Havnes, A. (2008). Peer-mediated learning beyond the curriculum. *Stud. High. Educ.* 33, 193–203. doi: 10.1080/03075070801916344

Hurtado, S., Dey, E. L., Gurin, P. Y., and Gurin, G. (2003). "College environments, diversity and student learning," in *Higher Education: Handbook of Theory and research*, ed. J. C Smart (Dordrecht: Kluwer Academic Publishers), 145–190.

Kahu, E. R. (2013). Framing student engagement in higher education. *Stud. High. Educ.* 38, 758–773. doi: 10.1080/03075079.2011.598505

Keay, J., May, H., and O'Mahony, J. (2014). Improving learning and teaching in transnational education: can communities of practice help? *J. Educ. Teach. Int. Res. Pedagogy* 40, 251–266. doi: 10.1080/02607476.2014.903025

Kidd, P., and Parshall, M. (2000). Getting the focus and the group: enhancing analytical rigour in focus group research. *Qual. Health Res.* 10, 293–308. doi: 10.1177/104973200129118453

Lancaster, K., and Strand, C. (2001). Using the team-learning model in a managerial accounting class: an experiment in cooperative learning. *Issues Account. Educ.* 16, 549–567. doi: 10.2308/iace.2001.16.4.549

Lawson, T. (1997). *Economics and Reality*. London: Routledge. doi: 10.4324/9780203195390

Lewin, K. (1948). *Resolving Social Conflicts*. New York: Harper and Row.

Lundberg, C. A. (2014). Peers and faculty as predictors of learning for community college students. *Community Coll. Rev.* 42, 79–98. doi: 10.1177/0091552113517931

Marton, F., and Pang, M. F. (2006). On some necessary conditions of learning. *J. Learn. Sci.* 15, 193–220. doi: 10.1207/s15327809jls1502_2

Marton, F., and Säljö, R. (1976). On qualitative differences in learning – I: outcome and process. *Br. J. Educ. Psychol.* 46, 4–11. doi: 10.1111/j.2044-8279.1976.tb02980.x

Mega, C., Runconi, L., and De Beni, R. (2014). What makes a good student? How emotions, self-regulated learning, and motivation contribute to academic achievement. *J. Educ. Psychol.* 106, 121–131. doi: 10.1037/a0033546

Mello, J. A. (1993). Improving individual member accountability in small work settings. *J. Manage. Educ.* 17, 253–259. doi: 10.1177/105256299301700210

Morrone, A., and Workman, S. B. (2014). "Keeping pace with the rapid evolution of learning spaces," in *The Future of Learning and Teaching in Next Generation Learning Spaces*, ed. K. Fraser (Bingley: Emerald Group Publishing Limited), 47–62. doi: 10.1108/S1479-3628_2014_0000012006

Orsmond, P., Merry, S., and Callaghan, A. (2013). Communities of practice and ways to learning: charting the progress of biology undergraduates. *Stud. High. Educ.* 38, 890–906. doi: 10.1080/03075079.2011.606364

Parker, I. (1992). *Discourse Dynamics: A Critical Analysis for Individual and Social Psychology*. London: Routledge.

Pawson, R. (1989). *A Measure for Measures*. London: Routledge and Kegan.

Prilleltensky, I., and Nelson, G. (2002). *Doing Psychology Critically: Making a Difference in Diverse Settings*. Basingstoke: Palgrave Macmillian.

Reid, M., and Hammersley, R. (2000). *Communicating Successfully in Groups: A Practical Guide for the Workplace*. London: Routledge.

Rienties, B., Johan, N., and Jindal-Snape, D. (in press). A dynamic analysis of social capital building of international and UK students. *Br. J. Sociol. Educ.* doi: 10.1080/01425692.2014.886941

Richardson, J. T. E. (1990). Reliability and replicability of the approaches to studying questionnaire. *Stud. High. Educ.* 15, 155–168. doi: 10.1080/03075079012331377481

Roberts, D. (2009). Friendship fosters learning: the importance of friendship in clinical practice. *Nurse Educ. Pract.* 9, 367–371. doi: 10.1016/j.nepr.2008.10.016

Rodriguez, C. (2009). The impact of academic self-concept, expectations and the choice of learning strategy on academic achievement: the case of business students. *High. Educ. Res. Dev.* 28, 523–539. doi: 10.1080/07294360903146841

Salomon, G., and Globerson, T. (1989). When teams do not function the way they ought to. *Int. J. Educ. Res.* 13, 89–99. doi: 10.1016/0883-0355(89)90018-9

Sayer, A. (2000). *Realism and Social Science*. London: Sage. doi: 10.4135/9781446218730

Senior, C., and Cubbidge, R. (2010). Enhancing employability in the 'ME generation'. *Educ. Train.* 6, 445–449. doi: 10.1108/00400911011068405

Senior, C., Howard, C., Reddy, P., Clark, R., and Lim, M. (2012). The relationship between student centred lectures, emotional intelligence and study teams: a social telemetry study with mobile telephony. *Stud. High. Educ.* 37, 957–970. doi: 10.1080/03075079.2011.556719

Senior, C., Reddy, P. A., and Senior, R. (2014). Employability and student engagement: towards a more unified theory. *Front. Psychol.* 5:238. doi: 10.3389/fpsyg.2014.00238

Sims-Schouten, W., Riley, S. C. E., and Willig, C. (2007). Critical realism in discourse analysis: a presentation of a systematic method of analysis using women's talk of motherhood, childcare and female employment as an example. *Psychol. Theor.* 17:101. doi: 10.1177/0959354307073153

Slavin, R. E. (1988). Cooperative learning and student achievement. *Educ. Leadersh.* 46, 31–33.

Spady, W. G. (1970). Dropouts from higher education: an interdisciplinary review and synthesis. *Interchange* 1, 64–85. doi: 10.1007/BF02214313

Tuckman, B. (1965). Developmental sequence in small groups. *Psychol. Bull.* 63, 384–399. doi: 10.1037/h0022100

Tymon, A. (2013). The student perspective on employability. *Stud. High. Educ.* 38, 841–856. doi: 10.1080/03075079.2011.604408

Walker, A. (2001). British psychology students' perceptions of group-work and peer assessment. *Psychol. Learn. Teach.* 1, 28–36. doi: 10.2304/plat.2001.1.1.28

Wang, Q., Woo, H. L., Quek, C. L., Yang, Y., and Liu, M. (2012). Using the facebook group as a learning management system: an exploratory study. *Br. J. Educ. Technol.* 43, 428–438. doi: 10.1111/j.1467-8535.2011.01195.x

Webb, G. (1997). Deconstructing deep and surface: towards a critique of phenomenography. *High. Educ.* 33, 195–212. doi: 10.1023/A:1002905027633

Wenger, E. (1998). *Communities of Practice. Learning, Meaning and Identity*. Cambridge: Cambridge University Press. doi: 10.1017/CBO9780511803932

Willig, C. (2013). *Introducing Qualitative Research in Psychology*, 3rd Edn. Buckingham: Open University Press.

Zhang, L. F. (2003). Does the big five predict learning approaches? *Pers. Indiv. Differ.* 34, 1431–1446. doi: 10.1016/S0191-8869(02)00125-3

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Student polling software: where cognitive psychology meets educational practice?

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The traditional lecture format still remains one of the most commonly used within higher education, yet it does not provide an optimal environment for learning (Draper and Brown, 2004). Here we will focus upon the use of questioning in large lecture halls and in particular the use of mass audience response systems (also known as clickers or polling systems). In writing this short opinion piece we will bring together some of the key findings from the educational literature, attention literature, memory literature, and wider debates within the Technology Enhanced Learning (TEL) literature, to present an integrated case for the use of online polling software as a partial solution to the challenges of student engagement in lecture halls. To cut a long story short: it is relatively easy to do, students generally like it, and it may well be good for them.

Focused attention is a crucial facet of effective learning (Risko et al., 2013) yet sustaining students' attention in contemporary lecture environments remains a challenge for even the most enthusiastic and engaging lecturers. In practice, maintaining students' attention can involve combatting at least two sources of stimulation competing for attentional resources: mind wandering (e.g., daydreaming, rumination, planning future events) and distraction from mobile technology. These attentional demands must be considered alongside the many challenges of understanding complex unfamiliar material. Mind wandering has been shown to increase with time (as lectures progress) and to impede subsequent comprehension (Risko et al., 2012). The increased presence of technology in lecture environments has also facilitated a rise in students' use of mobile technology devices for non-lecture based activities (e.g., web browsing and social networking) during timetabled sessions (Aguilar-Roca et al., 2012) leading to dual-task learning environments for some students as they divide their attention between the lecture material and different activities. As might be expected, research has shown that engaging in non-lecture based activities on laptops and other electronic devices during lectures negatively impacts on attention and retention. Students who reported high levels of laptop usage (multi-tasking) during lectures correlated with lower course performance and self-reports of a lack of understanding of course materials (Fried, 2008).

One well-established technique for re-engaging attention and minimizing mind wandering is to periodically pose students carefully considered questions. Such questions may test understanding of, or memory for, concepts presented earlier in the lecture or in previous lectures. They may also pose hypothetical scenarios for students to consider, or require them to formulate a view on a certain topic either in groups or individually. However, successfully generating engagement and debate remains challenging given the preceding issues discussed. Resultantly, many universities are now choosing to embrace Audience Response Technologies (ART), also known variously as Audience Response Systems (ARS), clickers, voting systems etc. with emerging research in the area showing that students respond positively to ART reporting that it is easy to use, encourages lecture attendance and is perceived as being both enjoyable and beneficial to their learning (MacGeorge et al., 2008). The interactive element of ART can facilitate wider debate that can subsequently clarify concepts, dispel misconceptions and improve students' understanding of materials (Lundeberg et al., 2011). Additionally, the anonymity provided by ART approaches serves to overcome issues associated with traditional "show of hands" methods, which can lead some students to respond in ways that are consistent with the majority in the room rather than their own thoughts and beliefs. Many students do not feel comfortable participating in lectures by way of more traditional methods; ART therefore offers students a channel of communication to be established between both their lecturer and their peers whilst maintaining a positive learning experience and fostering a more shared learning environment and subsequent participation (Draper and Brown, 2004). Such an approach also resolves limited student responses (often from the same small group of students) that are synonymous with en masse questioning techniques in large lecture theaters, which can subsequently encourage greater mind-wandering among non-participating students.

From a lecturing perspective, use of ART can aid educators in forming a more accurate perspective of how well course materials are being understood via evaluation of polling tools. In addition, students often report the receipt of feedback

on their performance as an important facet of their learning (Jump, 2011). Purported increases in attention (and sustained attention) are evident in the findings of Mayer et al. (2009), who reported that students who had been delivered course materials that included ART scored higher on mid-term and final exams, than students receiving materials that contained no ART element. Moreover, students in the ART condition also scored higher than students who were delivered course materials that included a paper-based interactive learning element.

The arguments above assume that there is a relationship between attending to lecture material and subsequent measures of learning and retention. Whilst we might hope such a relationship was causal, the mechanisms that underlie it are unclear and there are likely to be multiple potential explanations for any one individual. Part of any potential explanation may not only include the increased attention to the material but also the experience of being tested on the information. A growing body of evidence suggests that the provision of tests within classrooms does improve subsequent memory for that information, and related information, across a wide range of different types of materials, different types of test, and in different educational settings. In a recent review Dunlosky et al. (2013) explored the effectiveness of 10 different learning techniques that were either drawn from the research literature in cognitive psychology and educational psychology, or were commonly reported by students as a technique they adopted. These therefore ranged from highlighting notes and rereading, to self-explanation and imagery use. Research evidence concerning each of these learning techniques was judged against a set of criteria including the generalizability of the findings to different learner characteristics, and evidence from educational contexts in addition to laboratory settings. In comparing the relative utility, the two techniques that rated most highly were practice testing and distributed practice.

Practice testing generally refers to completing test(s) for information that aren't for summative purposes. The evidence for practice testing is strong, with clear benefits for students across a range of question types which can transfer to improvements in summative assessments, even if presented in different formats (see Glass and Sinha, 2013 for a recent review). In the lecture hall environment, practice testing might involve asking free recall, or multiple-choice, questions of students testing aspects of that lecture, or previous aspects of the course. On courses in which key concepts are carried over from lecture-to-lecture (such as statistics or research methods) repeated testing on these concepts will enable students to better retain and latterly recall these. The use of in-class polls is therefore likely to not only help reinstate attention, but will help latter recall for the information being polled which reflects previously presented lecture content.

The evidence base for the use of in-class polls and voting systems is therefore supported by research literature, within cognitive psychology, which supports both the attentional and memorial benefits to such approaches. As previously stated, the use of ART has begun to be adopted by some universities for different reasons, and we would argue that the attentional and memorial benefits should be part of these. However, staff can often face technical difficulties (e.g., software compatibility, malfunctioning hardware), organizational difficulties (e.g., sourcing funding, technical support) and classroom challenges (e.g., distribution/collection of handsets). One solution to these difficulties is to make use of online polling software such as www.polleverywhere.com.

Online polling software allows students to respond to both multiple-choice and open response questions using a range of technological devices. Results can then be displayed directly in class presentations in different ways. The first clear advantage of online polling over other comparable methods is that students are able to give longer and more detailed responses. Online polling that makes use of devices such as mobile phones allows students to provide text as answers, taking advantage of their own texting skills. This is particularly beneficial in regards to the effects of practice testing, in which free recall of information in response to questions is thought to be more beneficial over and above other methods of testing such as providing cues or "fill in the blank" type answers (e.g., Glover, 1989; Carpenter and Delosh, 2006). More elaborate answers provided in this way also offers the instructor an opportunity to provide more tailored feedback, with informative feedback being an essential part of the learning process (e.g., Bangert-Drowns et al., 1991). The results of online polls are also available to lecturers after the event, allowing them to reflect upon the responses. Furthermore, the use of online polling does not require handsets to be handed out or replaced thus preserving valuable classroom time for learning activities.

In comparison to other uses of classroom technology, online polling software also has the added advantage that it can adequately address the concerns of more conservative adopters of technology and is therefore more viable for wider adoption. It is widely acknowledged that Faculty can often be slow to adopt developing technologies into the classroom and many would argue rightly so. Common concerns about the adoption of technological solutions in classrooms include: increasing divisions between students who do have access to the technology and those that don't; continuous innovation in the absence of an evidence base; and protecting data privacy (Plesch et al., 2013). The use of online polls addresses some of these common concerns that often underpin resistance to adopting technology. Reputable online polls will provide services in which no information about the user is kept or tracked allowing students to engage with the opportunity yet retain their privacy. Online polling that makes use of the text facility of mobile phones, a standard feature of this common technology, would not fuel divisions in the same way that making use of tablet computing, or laptops might. Finally, we hope that the evidence presented here is sufficient for readers to appreciate that whereas the evidence base for many uses of technology is developing slowly, the use of online polling and ART aligns with some of the evidence drawn from cognitive psychology in respect of memory, learning and attention. In addition to the attentional benefits of engaging students with questions, and the memorial benefits of in-class testing, online polling makes use of technology that the vast majority of students have, respects their privacy, and does not require an educator to drastically alter

their pedagogical approach as part of the process of adoption.

Maintaining student engagement with lectures against the backdrop of mind-wandering, inattention and technological distraction poses a major challenge for many teaching staff across the sector. Ultimately, permitting students the use of technology in lectures is the lecturer's decision. Allowing the use of technology risks the loss of student attention to non-lecture based technology usage; alternatively, prohibiting technology usage may simply increase the amount of mind wandering. A more palatable alternative to both of these options would be to harness them as lecture-focused technologies as a means of reinstating attention and minimizing mind wandering whilst promoting learning and positively harnessing student preferences for access to/use of technology during lectures. While ART is not a comprehensive "solution" to the aforementioned issues, we have argued here that online polling software is ideally placed to help teaching staff address these challenges. Of course appeals to engage students during lectures, using techniques that help students retain information, and integrating technology in the classroom are by no means new methods. In writing this brief opinion piece our aim was to bring together some of the key findings from educational literature, attention literature, memory literature, and wider debates within the TEL literature, to try and present an integrated case for this single practice. Whilst more evidence is always needed, we are perhaps at a point now where we should be asking why we don't use in-class polling rather than why we do.

REFERENCES

Aguilar-Roca, N. M., Williams, A. E., and O'Dowd, D. K. (2012). The impact of laptop-free zones on student performance and attitudes in large lectures. *Comput. Educ.* 59, 1300–1308. doi: 10.1016/j.compedu.2012.05.002

Bangert-Drowns, R. L., Kulik, C. L. C., Kulik, J. A., and Morgan, M. (1991). The instructional effect of feedback in test-like events. *Rev. Educ. Res.* 61, 213–238. doi: 10.3102/00346543061002213

Carpenter, S. K., and Delosh, E. L. (2006). Impoverished cue support enhances subsequent retention: support for the elaborative retrieval explanation of the testing effect. *Mem. Cogn.* 34, 268–276. doi: 10.3758/BF03193405

Draper, S. W., and Brown, M. I. (2004). Increasing interactivity in lectures using an electronic voting system. *J. Comput. Assist. Learn.* 20, 81–94. doi: 10.1111/j.1365-2729.2004.00074.x

Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., and Willingham, D. T. (2013). Improving students' learning with effective learning techniques: promising directions from cognitive and educational psychology. *Psychol. Sci. Public Interest* 14, 4–58. doi: 10.1177/1529100612453266

Fried, C. B. (2008). In-class laptop use and its effects on student learning. *Comput. Educ.* 50, 906–914. doi: 10.1016/j.compedu.2006.09.006

Glass, A. L., and Sinha, N. (2013). Multiple-choice questioning is an efficient instructional methodology that may be widely implemented in academic courses to improve exam performance. *Curr. Dir. Psychol. Sci.* 22, 471–477. doi: 10.1177/0963721413495870

Glover, J. A. (1989). The 'testing' phenomenon: not gone but nearly forgotten. *J. Educ. Psychol.* 81, 392–399. doi: 10.1037/0022-0663.81.3.392

Jump, L. (2011). Why university lecturers enhance their teaching through the use of technology: a systematic review. *Learn. Media Technol.* 36, 55–68. doi: 10.1080/17439884.2010.521509

Lundeberg, M. A., Kang, H., Wolter, B., delMas, R., Armstrong, N., Borsari, B., et al. (2011). Context matters: increasing understanding with interactive Clicker Case studies. *Educ. Technol. Res. Dev.* 59, 645–671. doi: 10.1007/s11423-010-9182-1

MacGeorge, E. L., Homan, S. R., Dunning, J. B., Elmore, D., Bodie, G. D., Evans, E., et al. (2008). Student evaluation of audience response technology in large lecture classes. *Educ. Technol. Res. Dev.* 56, 125–145. doi: 10.1007/s11423-007-9053-6

Mayer, R. E., Stull, A., DeLeeuw, K., Almeroth, K., Bimber, B., Chun, D., et al. (2009). Clickers in college classrooms: fostering learning with questioning methods in large lecture classes. *Contemp. Educ. Psychol.* 34, 51–57. doi: 10.1016/j.cedpsych.2008.04.002

Plesch, C., Kaendler, C., Rummel, N., Wiedmann, M., and Spada, H. (2013). Identifying areas of tension in the field of technology-enhanced learning: results of an international delphi study. *Comput. Educ.* 65, 92–105. doi: 10.1016/j.compedu.2013.01.018

Risko, E. F., Anderson, N., Sarwal, A., Engelhardt, M., and Kingstone, A. (2012). Everyday attention: variation in mind wandering and memory in a lecture: mind wandering. *Appl. Cogn. Psychol.* 26, 234–242. doi: 10.1002/acp.1814

Risko, E. F., Buchanan, D., Medimorec, S., and Kingstone, A. (2013). Everyday attention: mind wandering and computer use during lectures. *Comput. Educ.* 68, 275–283. doi: 10.1016/j.compedu.2013.05.001

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Teaching statistics using dance and movement

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A BPS Public Engagement Grant was awarded to the author, with Dr. Carl Senior of Aston University, to make a series of films which helped to demonstrate statistical concepts in psychology using dance and movement. These films have engaged students and educators internationally and across many sectors, not only the intended psychology students, with over 100,000 collective views on YouTube. Many educators have remarked upon how they could use them in their own classes. This paper reviews the anecdotal and empirical evidence in this area and invites others to contribute to a discussion of artistic ways of engaging students, both at university and more generally.

The response to these pieces has been surprising, not least because the films have been so far-reaching and apparently useful for so many with an interest in statistics. Blogs and articles by educators show that students of all ages and from a wide range of sectors have been introduced to the concepts, from nursery school children who were encouraged to describe and compare the dances in very basic terms, to trainee veterinary surgeons, marketing students, dancers studying business, nurses, as well as the expected psychology and social science students. Exactly what it is about the films that makes the concepts more lucid is unclear and some research in this area would be welcome. In his "Dance Lab" at the University of Hertfordshire, Dr. Peter Lovatt has conducted research into the effects of participating in and watching dance. However, little empirical literature has been published which looks at dance as a pedagogical tool. A small amount of literature, as well as anecdotal evidence suggests that learning in this way works, at least for some. But why? Stolberg (2006) discusses a handful of educators who have successfully communicated science through dance and presents some evidence supporting pedagogies which include collaborations between dance and science (see also Hanna, 2001). Keinanen et al. (2000) looked at studies which investigated whether "dance instruction" improved reading skill and found only small effect sizes. However, McMahon et al. (2003) found that a dance-integrated program improved basic reading comprehension in first-grade students in comparison to a control group. A number of schemes also exist in primary and secondary education which utilize movement and dance in the curriculum. In her dance classes at Brindishe Green School, Jenny Powel uses this "embodied learning" to get pupils thinking about topics in other areas of the curriculum, and research at The Place ("LearnPhysical," Twiner et al., 2010) and the Open University (Grainger and Barnes, 2006) suggests that dance can improve cross-curricular learning (see also "Human Body, Reading and Tessellation" and "Dancing in Science" in the Great Primary Lesson Ideas series by The STEM Centre, n.d.[1,2]). One paper tested whether dance and movement improved understanding of electrocardiograms in third-year pharmacy students (Schultz and Brackbill, 2009). They observed improved student scores for those who participated in the dance condition. However, some said they were out of their comfort zone. This type of learning isn't for everyone.

"Statistics" and "dance" aren't words that are often uttered in the same sentence. However, this appears to be changing. The increasingly popular annual "Dance Your PhD" competition was started by John Bohannon who states in his TEDx Brussels talk entitled "Dance vs. Powerpoint, a modest proposal" (Bohannon, 2011), that "dance really can make science easier to understand," and that sometimes "the ideal may be to use no words at all." There are a number of organizations specifically dedicated to the integration of art with science and maths (for example, Maths Busking, The SciArt Center, Maths Dance, Art & Science Journal, Art of Science, Sci Art and Sci Arts), and there exist annual prizes for integration and collaboration in this area (for example, the Art Science Prize, artscienceprize.org). The popularity of these approaches suggests that there is an appetite for this kind of work. Many of these initiatives are designed for younger students, with little of this type of initiative available to students in higher education. This may not be surprising when one considers the often quite formal attitude that may be adopted at university. However, as Eric Stern and Karl Schaffer claim in their TED talk entitled "Math Dance" (TEDx Manhattan Beach, 2012) (Stern and Schaffer, 2012), using movement in the classroom works and is far

[1] National STEM Centre. Human Body, Reading and Tessellation, from the Great Primary Lesson Ideas series, Playback Schools., (n.d.). [Video file]. Retrieved December 17th, 2014 from http://www.playbackschools.org.uk/programme/2015/human-body-reading-and-tessellation

[2] National STEM Centre. Dancing in Science, from the Great Primary Lesson Ideas series, Playback Schools., (n.d.). [Video file]. Retrieved December 17th, 2014 from http://www.playbackschools.org.uk/programme/1351/dancing-in-science

from a distraction. Their interest is the connection between ideas and movement, and they state that "embodying the problem is memorable, social, creative… it makes mathematical ideas accessible," and this is certainly supported by the anecdotal evidence surrounding the BPS Dancing Statistics films. Of course, many lecturers already incorporate embodied learning in their work. There's the famous "did you see the gorilla?" experiment demonstrating selective attention which is often re-enacted in cognitive psychology lectures, or the colleague who had a faculty member don a disguise and "break in" to the main lecture theater, mid-lecture, run down the stairs between all 200 students, cut the lecturer's tie, throw a custard pie in his face before escaping in an attempt to demonstrate the problems surrounding eye-witness testimony, and the lecturer who requests student volunteers to help demonstrate fMRI machines by spinning around at the front of the lecture hall. What seems to work about these examples is that they are all physical, are often funny, and are memorable to students; there was some action, their mates were involved, it was something different and it was unexpected.

Demonstrating complex statistics using dance is not to "sugar coat" the concepts; the films are not substitutes for lectures. Rather, the aim is to engage students and make them think about statistical concepts in different and memorable ways. Potentially this could take away some of the fear many psychology undergraduates experience when faced with this new way of thinking; there is a saying *it's like learning Greek* when faced with mastering a challenging topic. In this case it literally is. And there's some algebra thrown in there too for good measure. There may even be three or four names which describe the same thing, depending on current trends, whether you're reading a US or UK text, etcetera etcetera. What a minefield. Is it any wonder psychology students are often afraid of the mere idea of "statistics" before they even begin?

One does not passively watch these films. Rather, the audience is gently guided through each film and told what to consider as they watch. This brings an interactive feel to the pieces, something students often say is important for their engagement on a course. Being featured on the BPS YouTube channel means people can watch them anytime on computers, smart-phones and tablets and means they can view them anywhere with an internet connection. Students like the flexibility to study in their own way, at times that suit them and on their own devices (any lecturer knows how difficult it is to get students to use the university email address rather than their Hotmail or Gmail ones). Designing teaching methods which acknowledge this pedagogical development is crucial if we want to continue to recruit dynamic and enthusiastic students as we may lose them if we don't. An increasing number of faculty members working in higher education are using social media in their classrooms, with videos from YouTube (or elsewhere) being rated as the most valued way of using social media for teaching (Moran et al., 2011). Gone are the days of packed lecture theaters and 5 days per week spent on campus. Much more common now are distance learning, "webinars," and virtual learning environments, as well as the use of technology in the classroom (Berk, 2009), a development undoubtedly influenced by the advancement of "Web 2.0" (the increasingly collaborative and social nature of the Internet, O'Reilly, 2005). Berk (2009) suggests that benefits to learning from using video in teaching may include generating interest; creating a sense of anticipation; increasing imagination; increasing recall of content and flow of ideas; being inspiring and motivating; making learning fun, and, perhaps most relevant here, "decreasing anxiety and tension on scary topics" (p. 2). Easily available online resources are increasingly valuable for this climate. YouTube may be one of the first places students go to when they need the answer to a problem (Duffy, 2008).

There are no voiceovers on the Dancing Statistics films. This was decided initially to reduce the risk of them sounding like mini-lectures. However, it has proved doubly-fortuitous as it means they can be understood without sound. This is beneficial for both students and lecturers as in the latter case they can turn down the volume and provide their own commentary. One of the most pleasing pieces of feedback received was the films being described as "little meditations: one has to concentrate, but not that hard" (personal communication, 2013). The YouTube comments and "Tweets" about the films are overwhelmingly positive, with a sizeable number of them referring to the fact they explain "stats without numbers." In the year since their release, I have had requests for the captions in the films to be translated into Hebrew, French, and Spanish for use in universities in Israel, Canada and Costa Rica.

A project in the United States, which is receiving increasing amounts of attention, aims to engage schoolchildren in urban areas who are "under-achieving" (Emdin, 2010). The teaching revolves around hip-hop music and culture, a salient and prevalent influence in many of the students' lives. It is clear that the purpose is to engage students by connecting with them at a level which they are comfortable with. As Emdin states of students learning science, "it must be clear that disinterest, lack of participation, or poor performance is not the result of an intellectual deficiency, or an inability to grasp the content. It is rooted in an inability of educators to teach a new way" (2010, p. 10). A similar claim could be made for the teaching and learning of statistics. This approach is certainly not about being cool and "down with the kids," something that's usually embarrassing for all involved. Rather, it is acknowledging what students can relate to and using that connection to spark their interest and engage them in a new way.

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REFERENCES

Berk, R. A. (2009). Multimedia teaching with video clips: TV, movies, YouTube, and mtvU in the college classroom. *Int. J. Technol. Teach. Learn.* 5, 1–21.

Bohannon, J. (2011). *Dance vs. Powerpoint, a modest proposal. TEDx Brussels. [Video file].* Available online at: http://www.ted.com/talks/john_bohannon_dance_vs_powerpoint_a_modest_proposal?language=en (Retrieved March 8, 2014).

Duffy, P. (2008). Engaging the youtube google-eyed generation: strategies for using web 2.0 in teaching and learning. *Electron. J. e-Learn.* 6, 119–130.

Emdin, C. (2010). *Urban Science Education for the Hip-Hop Generation*. Rotterdam: Sense Publishers.

Grainger, T., and Barnes, J. (2006). "Creativity in the primary curriculum," in *Learning to Teach in the Primary School*, eds J. Arthur, T. Grainger, and D. Wray (London, UK: Routledge), 209–225.

Hanna, J. L. (2001). The language of dance. *J. Phys. Educ. Recreat. Dance* 72, 40–53. doi: 10.1080/07303084.2001.10605738

Keinanen, M., Hetland, L., and Winner, E. (2000). Teaching cognitive skill through dance: evidence for near but not far transfer. *J. Aesthet. Educ.* 34, 295–306. doi: 10.2307/3333646

McMahon, S., Rose, D., and Parks, M. (2003). Basic reading through dance program: the impact on first-grade students' basic reading skills. *Eval. Rev.* 27, 104. doi: 10.1177/0193841X02239021

Moran, M., Seaman, J., and Tinti-Kane, H. (2011). *Teaching, Learning, and Sharing: How Today's Higher Education Faculty Use Social Media*. Boston, MA: Pearson Solutions.

O'Reilly, T. (2005). *What Is Web 2.0? Design Patterns and Business Models for the Next Generation of Software*. Available online at: http://www.oreilly.com/pub/a/web2/archive/what-is-web-20.html (Accessed December 15, 2014).

Schultz, K. K., and Brackbill, M. L. (2009). Instructional design and assessment: teaching electrocardiogram basics using dance and movement. *Am. J. Pharm. Educ.* 73, 1–5. doi: 10.5688/aj730470

Stern, E., and Schaffer, K. (2012). *Math dance: Erik Stern and Karl Schaffer at TEDx Manhattan Beach. [Video file]*. Available online at: https://www.youtube.com/watch?v=Ws2y-cGoWqQ (Accessed March 8, 2014).

Stolberg, T. L. (2006). Communicating science through the language of dance: a journey of education and reflection. *Leonardo* 39, 426–432. doi: 10.1162/leon.2006.39.5.426

Twiner, A., Coffin, C., Littleton, K., and Whitelock, D. (2010). *Learn Physical Interactive Evaluation: Autumn and Spring term, 2009/2010*. Available online at: http://www.theplace.org.uk/sites/default/files/downloads/LearnPhysical%20Interactive%20Evaluation.pdf (Accessed December 19, 2014).

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The effects of family support and gender on mature student engagement in higher education

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Keywords: mature, students, family, gender, university

While the factors driving the engagement of female mature students in the higher education sector (HE) have been extensively studied, e.g., Carney-Compton and Tan (2013) little work, if any, has been carried out examining the factors that drive engagement of their male counterparts. In light of the recent calls by various government-based think-tanks to expand the mature student population within HE, there is an obvious and urgent need to address this gap in our understanding (Bekhradnia, 2007; Sastry and Bekhradnia, 2007). Here the experiences of mature students at university, and the unique impact gender may have in influencing their initial motivation to enter HE, the responsibilities they bear, and the support they enjoy, are examined. While gender may underpin significantly diverse experiences of men and women at university, such diversity may have implications for the sector and the subsequent redesign of effective pedagogy.

Within the UK the Widening Participation agenda actively promotes the increased engagement of "non-traditional" learners in HE, and as such there has been a sharp increase in the participation of older students, with these mature learners embarking on higher level learning from a wide range of backgrounds and bringing with them a breadth of experiences (Thomas, 2001). However the rapid growth associated with the mature student population has brought with it a clarion call to ensure that HE provision is appropriately redesigned to ensure that these unique students engage fully with their learning experience at university. Such reflection is imperative as engagement as a mature student can have a transformative impact on the lives of not just the student but their families as well (Wainwright and Marandet, 2010). To this end, a significant amount of research has explored the impact of family on the mature student experience, however as alluded to above, such research focusses primarily on the experiences of mature female students, extensively and ostensibly documenting the barriers that women face in accessing and progressing through their studies (Edwards, 1993; Reay et al., 2002; McGivney, 2003). The pervasive emphasis of understanding the factors that drive the engagement of female students is perhaps quite unfortunate, especially in light of the fact that familial motivations are now seen as the primary facilitator for education engagements in male pupils across the diversity of racial and cultural boundaries (Kenny and Donaldson, 1991; Gloria et al., 2005). By and large such work has been primarily embedded within the secondary education sector and as these pupils transition into HE students, it is likely that the significance of such extrinsic motivations will remain. Yet surprisingly little is known of the effects of familial motivations on male mature student populations. While key sociological research in this area has identified the need for familial support when encountering a change in social identity that the mature student inevitably goes through as they progress through their respective programmes of study (Baxter and Britton, 2001), such work is predominantly focussed on the experiences of female mature students and as such research is needed to fully explicate the experience and the impact, if any, of family on the male student experience.

The motivation displayed by older learners to engage with a university programme of study has been the focus of a number of studies which have identified the vocational drivers for many mature students, as well as exploring the sense of unfulfilled potential often borne by those who opted to return to education (Britton and Baxter, 1999). While intrinsic motivation appears to be key in both the decision-making and subsequent success of older learners (Murphy and Roopchand, 2003; McCune et al., 2010), the decision to return to learning is often generated by key life transitions, whether situational events such as unemployment or divorce, or dispositional aspects of personal satisfaction; all key influencers on family well-being. Here, individuals enter HE as a mechanism to redress the balance in an unsatisfactory life, both individually and for their families (Dawson and Boulton, 2000). Motivation may be gendered; male students are labor-market focussed, with an aspiration to better provide materially for their family, while female students may seek personal improvement to offer inspirational role models for their children (Marks et al., 2003). Recent studies have further explored the power that education has as a tool for social mobility and inter-generational learning, with mature learners expressing a desire to promote higher aspirations in their own children by embarking on a programme of study themselves (Wainwright and Marandet, 2010).

It goes without saying that the transition to university is not a solitary experience for the mature student and is one that does impact the whole family unit (Kantanis, 2002). Here the various reactions of family, which can range from encouragement through to mockery, envy and resentfulness, impact significantly on the transition of the individuals into their new role as a mature student. This study found that the level of support offered was mediated by the value placed on education by the immediate family and friends as well as the understanding of the student's motivation for returning to education. Familial support was further influenced by the level of disruption that the family would incur; indeed, unwillingness in general to cause change was identified in a study exploring the reasons for the non-participation of potential older learners. where the individual's reliance on their informal networks of family and friends instilled a reluctance to disrupt the status quo (Fuller and Heath, 2010).

The familial influence on mature students is inextricably linked to gendered roles within the family, notably the traditionally female role of carer in contrast to the conventional male role of provider. Studies have highlighted the barriers and challenges faced by women with child caring responsibilities (Leppel, 2002). Their situation has tended to be problematized, identifying the conflict between the role of carer and the role of student, with the two identities at odds with each other (McGivney, 1999). Arguably men are better able to separate their personal and domestic lives from their academic and career aspirations with significantly more support from their partners (Tett, 2000). The vital importance of support has been stressed in an extensive study exploring the "public" and the "private" lives of female mature students, which found that the greatest emotional toll was felt by women with children and an unsupportive family, often compounded by cultural expectations (Edwards, 1993). The clear correlation between levels of support, satisfaction, stress and self-esteem suggests that male students may benefit significantly from the higher level of support they receive, thus impacting their engagement with HE (Norton et al., 1998; Winn, 2002). As is evident, much of this research on support that men may benefit from is a little dated; this warrants renewed investigation, to assess the experiences of male students today.

The decision to return to learning as a mature student is significantly mediated by other factors such as cultural and socio-economic background, the impact of which is inextricably linked to gender (Baxter and Britton, 2001). Becoming a student not only challenges traditional gender roles and identity within the family, to be in education potentially challenges traditional male working class identity, threatening both an individual's sense of self and demanding renegotiation of their relationships with others. Take the finding that perceived social class plays a major role in the decision to become a mature student, sociological research shows that study in HE is not viewed as a working class activity, but is seen as self-indulgent and firmly entrenched in the traditional and masculine gender roles of the provider (Marks et al., 2003). This is inextricably linked with the connotations of being be a "good" parent. While women are deemed nurturers, offering emotional support for their offspring, men's roles are embedded in that of providing for their family in financial and material terms. Concepts of masculinity and its relationship with class and ethnicity can inform working men's decisions not to participate in a programme of study in HE, with the conceptualization of university students in a framework of negative, middle class masculinity significantly alien to their own lives (Archer et al., 2001).

For those adults considering returning to education as mature students, the decision-making process is often based on a costs and benefits analysis for the family unit and that may be mediated by gender (Davies et al., 2002). Potential mature students view the option of higher education as an immediate investment of time and money by not just the individual, but the family. Any potential benefits are seen as delayed and uncertain; future rewards versus debt or unemployment; personal achievement versus failure; time versus family and relationship obligations, and financial implications of supporting a family whilst studying (Davies and Williams, 2001). This raises the pertinent question of the worth of a degree, whether real or perceived; despite a report by the UK based University think-thank, the Million+ and LSE (2013) the rate of return on the investment of time and money can be variable, and may be influenced by age and gender. Non-economic benefits are, however, significant, in the form of intergenerational benefits and increased potential for social mobility of the family, although mature students may find it more difficult to gain graduate employment, with a lower rate of earnings growth and higher levels of job dissatisfaction, and the consequent impact on their families (Purcell et al., 2007).

This historical, and perhaps wholly understandable focus on the experiences of mature women learners, while illuminating the distinct experiences of this group, nevertheless leaves a gap in our understanding of the specific nature of mature men's experiences of higher education, with the danger of making assumptions about the changing nature of their participation based on historical research on women's experiences. Such studies that do exist incorporating the male experience tend to be rather dated, presenting us with only a limited understanding of their world. This has wide-reaching implications across the sector in how we support such students through their studies. There is a clear need to recognize the multiple identities displayed by male mature students; what it is in their decision-making, their social identity, and their role within the family, that hinders or underpins their choices, and how institutions can harness the positive aspects, diminish the influence of the impediments, and develop innovative support mechanisms. Levels of female participation have escalated across the HE sector in accordance with the specific support mechanisms that facilitate the engagement of female mature students. The time is ripe to consider whether these existing mechanisms are appropriate for men.

REFERENCES

Archer, L., Pratt, S. D., and Phillips, D. (2001). Working-class men's constructions of masculinity and negotiations of (Non)participation in higher education. *Gend. Educ.* 13, 431–449. doi: 10.1080/09540250120081779

Baxter, A., and Britton, C. (2001). Risk, Identity and change: becoming a mature student. *Int. Stud. Soc. Educ.* 11, 87–104. doi: 10.1080/09620210100200066

Bekhradnia, B. (2007). *Demand for Higher Education to 2020 and Beyond*. Oxford. Available online at: http://www.hepi.ac.uk/downloads/31HEDmenadto2020andbeyondfull.pdf

Britton, C., and Baxter, A. (1999). Becoming a mature student: gendered narratives of the self. *Gend. Educ.* 11, 179–193. doi: 10.1080/09540259920681

Carney-Compton, S., and Tan, J. (2013). Support systems, psychological functioning and academic performance of non-traditional female students. *Adult Educ. Q.* 52, 140–154. doi: 10.1177/0741713602052002005

Davies, P., Osborne, M., and Williams, J. (2002). *For Me or Not For Me? That is The Question. A Study of Mature Students' Decision-Making and Higher Education*. Norwich: DfEE.

Davies, P., and Williams, J. (2001). For me or not for me? Fragility and risk in mature students' decision-making. *High. Educ. Q.* 55, 185–203. doi: 10.1111/1468-2273.00182

Dawson, E., and Boulton, P. (2000). Returning to Education: a question of balance? *J. Access Credit Stud.* 2, 164–177.

Edwards, R. (1993). *Mature Women Students: Separating or Connecting Family and Education*. London: Taylor & Francis.

Fuller, A., and Heath, S. (2010). "Educational decision-making, social networks and the new widening participation," in *Improving Learning by Widening Participation in Higher Education*, ed M. David (London: Routledge), 132–146.

Gloria, A. M., Castellanos, J., Lopez, A. G., and Rosales, R. (2005). An examination of academic nonpersistence decisions of latino undergraduates. *Hisp. J. Behav. Sci.* 27, 202–223. doi: 10.1177/0739986305275098

Kantanis, T. (2002). "Same or different: issues that affect mature age undergraduate students' transition to university," in *Paper Presented at the Changing Agendas - Te Ao Hurihuri 6th Pacific Rim First Year in Higher Education Conference 9-10 July 2002* (Christchurch).

Kenny, M. E., and Donaldson, G. A. (1991). Contributions of parental attachment and family structure to the social and psychological functioning of first-year college students. *J. Counsel. Psychol.* 38, 479–486. doi: 10.1037/0022-0167.38.4.479

Leppel, K. (2002). Similarities and differences in the college persistence of men and women. *Rev. High. Educ.* 25, 433–450. doi: 10.1353/rhe.2002.0021

Marks, A., Turner, E., and Osborne, M. (2003). "Not for the likes of me": the overlapping effect of social class and gender factors in the decision made by adults not to participate in higher education. *J. Further High. Educ.* 27, 347–364. doi: 10.1080/0309877032000128064

McCune, V., Hounsell, J., Christie, H., Cree, V. E., and Tett, L. (2010). Mature and younger students' reasons for making the transition from further education into higher education. *Teach. High. Educ.* 15, 691–702. doi: 10.1080/13562517.2010.507303

McGivney, V. (1999). *Excluded Men; Men Who are Missing From Education and Training*. Leicester: NIACE.

McGivney, V. (2003). *Staying or Leaving the Course: Non-Completion and Retention of Mature Students in Further and Higher Education (2nd Edn.)*. Leicester: NIACE.

Million+, and LSE. (2013). *What's the Value of a UK Degree?* London: Million +.

Murphy, H., and Roopchand, N. (2003). Intrinsic motivation and self-esteem in traditional and mature students at a post-1992 university in the north-east of England. *Educ. Stud.* 29, 243–259. doi: 10.1080/03055690303278

Norton, L. S., Thomas, S., Morgan, K., Tilley, A., and Dickens, T. (1998). Full-time studying and long-term relationships: make or break for mature students? *Br. J. Guid. Counsell.* 26, 75–88. doi: 10.1080/03069889808253840

Purcell, K., Wilton, N., and Elias, P. (2007). Hard lessons for lifelong learners? Age and experience in the graduate Labour Market. *High. Educ. Q.* 61, 57–82. doi: 10.1111/j.1468-2273.2007.00338.x

Reay, D., Ball, S., and David, M. (2002). "It's taking me a long time but I'll get there in the end": mature students on access courses and higher education choice. *Br. Educ. Res. J.* 28, 5–19. doi: 10.1080/01411920120109711

Sastry, T., and Bekhradnia, B. (2007). Higher *Education, Skills and Employer Engagement*. Available online at: http://www.hepi.ac.uk/downloads/30HEskillsandemployerengagementfull.pdf

Tett, L. (2000). "I'm Working Class and Proud of It" - Gendered experiences of non-traditional participants in higher education. *Gend. Educ.* 12, 183–195. doi: 10.1080/09540250050009993

Thomas, L. (2001). *Widening Participation in Post-Compulsory Education*. London: Continuum.

Wainwright, E., and Marandet, E. (2010). Parents in higher education: impacts of university learning on the self and the family. *Educ. Rev.* 62, 449–465. doi: 10.1080/00131911.2010.487643

Winn, S. (2002). Student motivation: a socio-economic perspective. *Stud. High. Educ.* 27, 445–457. doi: 10.1080/0307507022000011552

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Teacher enthusiasm: a potential cure of academic cheating

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In this research we claim that teachers' enthusiasm matters regarding student engagement in terms of academic cheating. Previous studies found that perceived enthusiasm of teachers is positively related to the intrinsic motivation of the students. However, it was less investigated how perceived enthusiasm is related to cheating. In the first exploratory questionnaire study ($N = 244$) we found that during the exams of those teachers who are perceived to be enthusiastic students tend to cheat less. In the second questionnaire study ($N = 266$) we took academic motivations into consideration and we found that the more teachers seem enthusiastic the cheating rate will be lower among university students. Aggregated teacher enthusiasm was positively related to intrinsic motivation, negatively related to amotivation, and not related to extrinsic motivation. Aggregated teacher enthusiasm was directly and negatively linked to cheating and it explained more variance in cheating than academic motivations together. These results suggest that teachers' perceived enthusiasm can be a yet unexplored interpersonal factor which could effectively prevent academic cheating.

Keywords: teacher enthusiasm, academic motivations, academic cheating

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The secret of genius is to carry the spirit of the child into old age, which meant never losing your enthusiasm.

Aldous Huxley

Introduction

The word enthusiasm derives from the Greek expression *enthousiasmos* which means a divine inspiration. According to its interpretation it refers to the phenomena when a god invades someone and it fills this person's soul with energy who becomes inspired, and who is in rapt or in ecstasy ("en" means in or into, "theos" means god). Nowadays, effective teachers are described with this characteristic. In the field of educational psychology, teachers' enthusiasm can be approached at least in two different ways (Kunter et al., 2011): first, the behavioral approach refers to stimulating and energetic instruction practices from an external observer's point of view as gestures, vocal delivery, or facial expressions (e.g., Collins, 1978; Sanders and Gosenpud, 1986); the second emphasizes the internal, subjective experiences (as a personal characteristic) of teachers who are enthusiastic for teaching and which deals with the teacher's behavior as a consequence of this internal state (Kunter et al., 2011).

The diversity of the enthusiasm definition is salient. Considering ten definitions between 1970 and 2013, early authors grasp its behavioral manifestation in terms of demonstrative gestures, varied intonations, facial expressions, energetic instructions (Rosenshine, 1970; Collins, 1978;

Bettencourt et al., 1983), later its positive effect on intrinsic motivation (it appears when a student engages in learning for the pleasure and satisfaction which is derived from the learning activity itself, see details below) is emphasized (Patrick et al., 2000), others describe it as an internal stable affective disposition which is linked to the motivation of the teacher. More recently, Kunter et al. (2011) focus on the internal, affective state of the teacher in terms of intrinsic motivation which promotes active involvement in teaching and leads to high quality instructional behavior. Keller (2011) similarly to early studies focuses on the behavior of teacher in terms of lively engaging presentation of class content and it appears as a personality-like characteristic which is linked to the competence and emotions of teachers. Finally, Haerens et al. (2013) conceptualize it as a positive form of involvement which goes hand in hand with the teacher engagement in warm interactions. In the present study, we intend to focus on the externally visible forms of enthusiasm instead of the subjective experience of teachers because we are afraid of social desirability biases and ceiling effect regarding self-reports of teachers concerning their enthusiasm.[1] Despite several educational textbooks claim that one of the keys of effective teaching is enthusiasm (Wong and Wong, 2001; Stronge et al., 2004; Brophy, 2006), only a few empirical studies were carried out to measure the effect of teacher enthusiasm on students' motivations, goals, and classroom behavior. However, all interpretation of teacher enthusiasm can have beneficial consequences concerning students' and pupils' learning-related emotions which are less examined in the literature of educational psychology than negative forms of learning-related emotions (Paoloni, 2014). These positive emotions can contribute both to the commitment to the task and to their stronger intrinsic motivations.

The Effect of Teacher Enthusiasm

Rosenshine (1970) summarized the most important teachers' enthusiasm-related studies prior to the 1970s. According to these early results, the students of those teachers who scored high on such behaviors as "stimulating", "energetic", "mobile", "enthusiastic", and "animated" have high achievements. Furthermore, the frequency of teachers' movement, gestures, variation in voice, and eye contact were also positively related to the achievement of pupils. Following this review in the seventies, several experimental studies found that teacher enthusiasm leads to high achievements of students (Wyckoff, 1973; Williams and Ware, 1976, 1977; Land, 1980). In the following years, several studies supported these results. Teacher enthusiasm has positive effect on such outcomes as on-task behavior (Bettencourt et al., 1983), recall (Stewart, 1989), and test performance (Marlin, 1991). Not only outcomes, but motivations are also affected by teacher enthusiasm. Patrick et al. (2000) found that teacher enthusiasm is among the most important variables which are related to students' intrinsic motivation. These results suggest not only the link between teacher enthusiasm and student outcomes, but also the causal effect of enthusiasm on achievements and motivations.

The question arises: how can teacher enthusiasm have positive effects on students' outcomes and motivations? Keller et al. (2013) summarize three main potential mechanisms behind the positive effects of teacher enthusiasm. The first explanation reflects on the attention-commanding aspects of enthusiastic teacher behavior. According to Bettencourt et al. (1983) demonstrative gestures, varied, dramatic body movements, or uplifting vocal delivery can hold the attention of students more effectively than less enthusiastic behaviors. According to the second explanation (Frenzel et al., 2009), enthusiastic teachers become role models for their students. In this way teacher enthusiasm helps the students to adopt the teachers' attitudes in terms of enjoyment and enthusiasm which lead to higher level of learning activity and more positive feelings toward learning (Brigham et al., 1992). The third explanation refers to the phenomena of emotional contagion (Hatfield et al., 1994). Teacher enthusiasm can be transmitted to students and it has positive effect on students' achievement and motivation in which first, the teacher's non-verbal communication draws the attention of students and second, she/he as a role model induces enjoyment and excitement regarding the exercises which lead to positive emotion regarding academic activities.

On the basis of the previous results enthusiasm has a positive effect on students' achievement and their motivation which can be explained by attention drawing characteristics of enthusiastic communication, by the role-model or emotional contagion theories. However, to our best knowledge previously neither the link between teacher enthusiasm and student academic cheating, nor the relationship pattern of teacher enthusiasm and school-related general motivations were examined. The goal of this research is declaring such relationships with questionnaire methods. The goal of the first study is exploring whether teacher enthusiasm can be related to academic dishonesty of students. The second, questionnaire study aims to explore the relationship pattern between academic motivations, enthusiasm, and cheating.

Academic Cheating

According to Brickman (1961) academic cheating reaches back to ancient times. The first recorded attempts happened in the ancient China when candidates for civil servants tried to cheat despite expected punishments for being caught were as severe as death penalty. Ehrlich et al. (1980, p. 141) defines cheating in general as behaving "dishonestly or unfairly in order to win some profit or advantage." Garavalia et al. (2007) complement this definition with the intentionality of such behavior. Hetherington and Feldman (1964) considering the

[1]According to a preliminary study we found significant relationship between self-reported enthusiasm of social desirability regarding a Hungarian high-school teacher sample ($N = 188$) by using Kunter et al.'s (2008) Teacher Enthusiasm Scale and the B shortened version (Reynolds and Gerbasi, 1982) of Marlowe Crowne Social Desirability Scale (1960). This social desirability scale correlated relatively strongly with Kunter et al.'s (2008) both subject enthusiasm scale ($N_{\text{items}} = 5$, 7-point Likert scale, 1 = not at all true, 7 = completely true) referring to topic-related affected orientation which involves enthusiasm toward the material ($r = 0.316$, $p < 0.001$) and teaching enthusiasm ($N_{\text{items}} = 5$, 7-point Likert scale, 1 = not at all true, 7 = completely true) referring to the enjoyment, pleasure and enthusiasm regarding the teaching activity ($r = 0.421$, $p < 0.001$). Furthermore, in the case of enthusiasm means—contrary to Kunter et al.'s (2008) results — ceiling effect was measured ($M_{\text{subject enthusiasm}} = 6.5$, $\text{SD}_{\text{subject enthusiasm}} = 0.54$; $M_{\text{teaching enthusiasm}} = 6.65$, $\text{SD}_{\text{teaching enthusiasm}} = 0.49$).

intentionality (unplanned vs. planned) of cheating made distinction between individual (i.e., using crib notes) and collaborative (i.e., whispering) forms of cheating. Furthermore, according to a further classification it is possible to distinguish plagiarism from exam cheating. While using cheating sheets or whispering are related to exam cheating, plagiarism refers to "the theft of words or ideas, beyond the point that would normally be regarded as general knowledge" (Park, 2003, p. 472). Considering such classifications in the present study, we focus on both individual and collaborative forms of intentional exam cheating.

Academic cheating is a universal phenomenon. It is present in every level of education (Anderman and Murdock, 2007). We can see a high prevalence rate among college and university students: according to the USA results (McCabe, 2005), 60% of university students cheated at least once during their academic career. Similar prevalence can be observed among South Korean (Park et al., 2013), Chinese (Ma et al., 2013), Hungarian (Orosz et al., 2013), and Western European (Teixeira and Rocha, 2010) students.

According to McCabe and Trevino (1997), two main groups of variables have effect on students' cheating behavior: individual (e.g., achievement goals or motivations) and contextual (e.g., classroom climate or personality of teachers) factors. Previous reviews and meta-analyses (McCabe and Trevino, 1997; Whitley, 1998) suggest that contextual factors have larger impact on students' cheating than individual factors. Therefore, we suppose that teacher enthusiasm as a contextual variable has larger impact on the cheating behavior than individual differences such as academic motivations. In the following, firstly, the effect of relevant cheating-related individual differences (academic motivations); later the effect of relevant cheating-related contextual (perceived enthusiasm) variables will be introduced.

Academic Motivations and Cheating

On the basis of the self-determination theory (SDT) of Deci and Ryan (1985), an *intrinsically motivated* student engages in learning for the pleasure and satisfaction which is derived from the learning activity itself (Deci et al., 1991). From the side of cheating, Anderman et al. (1998), Jordan (2001), and Orosz et al. (2013) found that those students who behaved honestly in exam situations have higher intrinsic motivation than those who cheated. Furthermore, Orosz et al. (2013) results show that besides the negative link between intrinsic motivation and self-reported cheating, intrinsic motivation of high school students negatively correlated with acceptance of cheating, positively related to guilt of cheating, and with the risk of detection of cheating.

According to Patrick et al. (2000) teacher enthusiasm is among the most important interpersonal variables which can have impact on students' intrinsic motivation: "...when a teacher exhibits greater evidence of enthusiasm students are more likely to be interested, energetic, curious, and excited about learning." (Patrick et al., 2000, p. 233). Therefore, we may suppose that enthusiastic teaching leads to higher levels of intrinsic motivation which besides its positive effects on achievement can reduce the level of cheating.

Extrinsic motivation is related to those goals, which are not favorable for their pure pleasure, but for the reward and punishments coming along with the purpose (Deci and Ryan, 1985; Deci et al., 1991). Students who were intrinsically motivated to learn cheated less, while the extrinsically motivated (e.g., getting a better grade to earn a scholarship) cheated more during academic assignments (Weiss et al., 1993; Anderman et al., 1998; Murdock et al., 2001). Jordan (2001) found that higher levels of intrinsic and lower levels of extrinsic motivation resulted in high level of honesty of students during exams and assignments.

Amotivation occurs when one does not find relationship between his/her behavior and the experienced consequences. Therefore, the state of amotivation lacks the intention of any kind of action related to a certain area. According to some studies (Harding et al., 2004; Angell, 2006; Orosz et al., 2013; Park et al., 2013) instead of extrinsic motivation, a general lack of academic motivation, thus amotivation plays an important role in determining whether a student would behave dishonestly or not.

On the basis of these studies, we suppose that intrinsic motivation will be negatively linked to cheating and amotivation will be positively related to students' cheating behavior. However, based on more recent studies (Orosz et al., 2013) with similar samples regarding extrinsic motivation, we expect no relationship with academic cheating.

The Effect of Teacher Enthusiasm on Academic Cheating

According to Genereux and McLeod (1995), the personality of the teacher influences the frequency of the students' cheating. Cheating rate is lower in the case of those teachers who are perceived as fair and friendly, who are respected by the students, and those who provide knowledge in an interesting way. Furthermore, on the basis of McCabe's (1999) qualitative study, secondary school students are more honest during exam if they perceive their teacher is motivated, friendly, and cares about their students' future. The opposite is true if students perceive their teacher does not care about them and their work. One of them expressed himself the following way: "A lot of the teachers that I've dealt with are always talking about how they can't wait to go home... acting like they don't want to be there. Their job is to teach me, and if they can't do that for me, then I'm going to do what I can to move up in the world. If cheating is what I have to do, then that's what I'm going to do." (McCabe, 1999, p. 685). According to the results of Murdock et al. (2001) if students evaluated their teachers' teaching competencies highly, their engagement and respect were negatively related to cheating. Cochran et al. (1999) found that most of the cheaters do not perceive the teacher competent, engaged, and as a good teacher, and they do not respect her/him. In line with these results, Genereux and McLeod (1995) also found that the interesting nature of the class, the moral engagement and the control of teacher influence students' attitudes toward cheating.

In sum, perceived characteristics and behavior of teachers influence students' inclination in dishonesties. If students see the teacher competent, motivated, friendly, fair, engaged, and caring, who gives interesting classes, they tend to cheat less. Furthermore, this is also true if they respect their teacher. If enthusiasm is

conceptualized as stimulating and energetic instruction practices with varied vocal delivery, demonstrative gestures, large body movements, vibrant facial expression, highly descriptive word selection, and acceptance of ideas and feelings (Collins, 1978) we expect that teacher enthusiasm can similarly reduce the inclination in cheating as the above-mentioned characteristics and behaviors.

Three explanations can be taken into account concerning the reasons why teacher enthusiasm can reduce cheating behavior of students. According to the first possible explanation, the verbal and non-verbal cues of enthusiastic teaching can direct effectively the attention of students to the topics they learn (Bettencourt et al., 1983). In this way the encoding of the material requires relatively low effort which leads to better performance with reduced probability of cheating. According to the second explanation, enthusiastic teachers can become easily role models of students (Frenzel et al., 2009). If a student perceives a teacher as a role-model we can expect that the student does not want to be unfair with the appreciated teacher by cheating during an assignment. The third explanation is related to the emotion contagion theories (Hatfield et al., 1994). On the basis of this theory the intrinsic motivation of the teacher can have positive effect on the student's interest and the heightened intrinsic motivation of the student will finally lead to decreased cheating occurrence. The present research intends to explore whether teacher's enthusiasm can be negatively related to student cheating.

Study 1: Teacher Enthusiasm and Academic Cheating of Students: An Exploratory Study

Introduction

The first goal of this study was to explore whether university students can categorize most of their teachers on the basis of their enthusiastic teaching practices. Furthermore, we intended to use self-reports in order to retrospectively quantify the occurrence of cheating among the students of those teachers whose teaching practices are more or less enthusiastic. We expected that students self-report less cheating on the exams of teachers who are perceived to be more enthusiastic compared to those teachers who are perceived less enthusiastic. According to previous studies, we expect higher self-reported cheating in the case of those teachers who are characterized by less enthusiastic teaching behavior compared to those whose teaching can be characterized by more enthusiasm.

Participants

The questionnaire was filled in by 266 Hungarian, full-time university students (152 women). The average age of the subjects was 21.48 (SD = 2.37). All of the participants were enrolled, full-time students of the University of Szeged. The study was conducted in accordance with the Declaration of Helsinki. All procedures were carried out with the adequate understanding and consent of the participants and with the approval of University of Szeged.

Measures and Data Analysis

On the first page of the questionnaire, demographic data, such as gender and age was asked from students. Besides the two demographical questions, a 13 item scale with closed items were used which is based on the Sanders and Gosenpud (1986) questionnaire measuring enthusiasm in connection with work. The items of the survey refer to eye contact, facial expressions, gestures, body movements, word selection, vocal delivery (pitch, speech rate etc.) and general energy level. In order to adjust the questionnaire to the Hungarian higher educational context, the original items were altered and completed. In the final version, the 13 items (see **Table 1**.) represented typical teaching behaviors. Items 1–6 represented the not enthusiastic behavior of teaching, while items 7–13 represented the enthusiastic teaching behavior. Each item could grasp only one aspect of the enthusiastic teaching and in this way we cannot claim that single items can be reliable and valid indicator of teacher enthusiasm as a whole. The respondents first decided whether they had a university lecturer from last year who can be characterized by these given behaviors (they were instructed to refer to the most typical teacher in case they had more than one) and then they were instructed to answer whether they cheated during the given teacher's exam. Therefore, students could think of maximum 13 different teachers. We predefined cheating to the students as a behavior which includes using cheat-sheets, copying, whispering, plagiarism, submitting the same script in different courses, using unauthorized electronic equipment, assuming another individual's identity during an exam or handing in an essay created by another person. With this data gathering method we intended to create a questionnaire which can be filled in quickly (less than 5 min) and without a lot of effort from the part of the students. Furthermore, we intended to explore whether students report less cheating concerning the exams of those teachers whose teaching behavior can be characterized by a special aspect of enthusiasm (items 7–13) compared to those teachers whose teaching activity can be described by a special aspect of non-enthusiasm (items 1–6).

The Process of Data Gathering

The participants were informed about the purpose of the research personally by Psychology BA students. The paper-and-pencil anonymous measurement was voluntarily filled out at Klebelsberg Library of the University of Szeged, the respondents did not get any compensation for the participation. They were ensured that their responses will be kept confidential. Besides the verbal information, the questionnaire indicated that it is fully voluntary and anonym. The subjects were asked to be as honest as possible to make sure we get authentic results. The average time to fill out a questionnaire was 5 min.

Results

The 266 participants could use most of our descriptions for one of their former teachers. For details see **Table 1**. The lowest proportion of students (70.3%) could remember a teacher who highly varied tone, volume, and excellence articulation, variation from rapid excited speech to whisper. Moreover, the largest proportion of students (96.6%) could remember a teacher who maintained eye contact, paid attention to the students' reactions, and did

TABLE 1 | Descriptive data concerning the teacher enthusiasm and self-reported cheating of students.

Items	Percentage of students who had a teacher who can be characterized with the description (%)	Percentage of students who cheated during the exam of this teacher (%)
(1) Standing or sitting in one place during all the course	86.1	66.9
(2) Reading booklets or slides	83.5	56.8
(3) Speaking in simple dialogs, rarely using similes and metaphors, explaining dimly	73.7	55.3
(4) Lethargic, inert, depressed, seems sleepy, and tired	74.4	48.1
(5) Not gesticulate or cramped, making clumsy movements at courses	71.8	28.2
(6) Expressionless face, a little musty or gloomy	78.2	18.8
(7) Dynamic and usually speaks by heart	94.4	15
(8) Maintains eye-contact while avoiding staring, pays attention to student's reactions	96.6	13.5
(9) Large demonstrative movements, rapid, energetic and natural movements and raises volume to emphasize	89.1	13.5
(10) Highly varied tone, pitch, volume and cadence, excellence articulation, variations from rapid excited speech to whisper	70.3	13.5
(11) Highly descriptive, excellent and frequently uses similes and metaphors	84.6	13.2
(12) Energetic, drive and spirit throughout sessions, inspiring	87.6	13.2
(13) Shining face, plays with mimicry and gestures, smiles a lot	82.7	9.4

not stare. Overall, in every case more than 70% of the students could characterize at least one teacher on the basis of our 13 descriptions which are related to enthusiastic teaching practices. Furthermore, **Table 1** provides information concerning whether students cheated or not during the teacher's exams who is characterized by our descriptions. The fewest number of students (9.4%) reported cheating if the teacher's teaching practice could be characterized by shining face, playful mimicry and gestures, and a lot of smiles. However, when the teacher's instructional practices were described as passive in terms of standing or sitting in one place during the whole course, almost 70% of the students reported exam cheating. Similarly high (56.8%) proportion of respondents reported cheating in cases of those teachers who read booklets or slides during the lecture. Participants reported relatively high cheating rate in case of those teachers who spoke in simple dialogs, rarely used similes and metaphors and explained dimly (55.3%); and in the case of those who were lethargic, inert, depressed, sleepy, and tired (48.1%). Concerning self-reported cheating rate, there is a larger gap between the above mentioned items and the fifth and sixth items (Not gesticulate or cramped, making clumsy movements at courses, 28.2%; Expressionless face, a little musty or gloomy, 18.8%). Contrasting to the first six items, cheating rate was between 9 and 15% in the case of the all of five enthusiastic behavior items. In sum, most participants could find a teacher who can be characterized by these enthusiasm dimensions, and visible differences appeared in terms of cheating between students of those teachers who are characterized by enthusiastic traits compared to those who are described as rather lethargic.

Discussion

The first descriptive study had two main results. First, students can retrospectively categorize teachers on the basis of the enthusiasm dimension of teaching practices. Second, the results suggest that teacher enthusiasm matters in terms of academic cheating. Seven times more students reported exam cheating in the case of those teachers who are standing or sitting during the whole course compared to those teachers who play with mimicry and gestures and who smile a lot with a shining face. But four times more cheating was reported during the exams of those teachers who read books and slides compared to those who are highly descriptive, excellent, and use metaphors.

Although the altered version of Sanders and Gosenpud (1986) measurement appears to be adequate for describing teachers' enthusiastic behavior, this study has several limitations. First of all, it is a self-report study which is based on memory recollection. These memories can be distorted over time. Second, students were asked to respond in a dichotomous scale while describing the teachers and regarding cheating, as well. A more refined continuous measurement would allow refined statistical analyses and it would allow the examination of the factor structure of the used enthusiasm scale. Third, in this case they could report cheating behavior in a generalized way including plagiarism, individual, and collaborative exam cheating, etc. A more detailed measurement could be useful for further analyses. Fourth, the used sample was not representative in any respect. Fifth, we did not measure the mediating effect of any potential variables.

The following study will challenge some of these limitations. Namely, Study 2 will provide the possibility to measure different forms of self-reported cheating behavior in a continuous and not in a dichotomous way. It allows in-depth statistical analyses regarding both internal structure of the used scales and their relationship patterns. Furthermore, in Study 2, students are allowed to estimate the proportion of their teachers who can be described with the enthusiastic behaviors above mentioned. Finally, in Study 2, we can explore the mediating effect of academic motivations between perceived aggregated teacher enthusiasm and self-reported cheating.

Conclusion

This study showed that teacher enthusiasm appears to be a relevant instructional behavior in reducing cheating behavior of

students which requires further, in-depth correlational and experimental examination.

Study 2: The Link between Teacher Enthusiasm, Academic Motivations and Academic Cheating

Introduction

Several studies investigated the relationship between cheating and academic motivation. Regarding teacher enthusiasm, it is considered to be one of the most important aspects of teaching (Brophy and Good, 1986). Patrick et al. (2000) found that by being enthusiastic, teachers can enhance students' intrinsic motivation. Moreover, if students considered their classes interesting (which is one of the cornerstones of intrinsic motivation), they cheated less (Pulvers and Diekhoff, 1999). Orosz et al. (2013) also concluded that intrinsic motivation can greatly reduce the possibility of cheating. Therefore, it would be possible to reduce the amount of academic dishonesty by putting emphasis on the intrinsic value of learning instead of emphasizing the importance of good grades (Tibbetts, 1999; Meece et al., 2006).

The main goal of the present study is to investigate whether teachers' perceived enthusiasm or academic motivation directly or indirectly—through academic motivations—influences students' self-reported academic cheating. On the basis of the studies mentioned above, we assume that aggregated teacher enthusiasm can reduce cheating through enhancement of the interest and intrinsic motivation of students or it might be possible that it has a motivation independent effect also on students' cheating behavior. If a student has a lot of enthusiastic teacher the frequency of cheating is lower considering all exams at the end of the semester. Enthusiastic teachers can create a more stimulating teaching environment (Kunter et al., 2008) and the verbal and non-verbal cues of the teaching behavior can direct the attention of the students to the given subject (Bettencourt et al., 1983) and it might be possible that students can more easily encode the material during the class, thus they will need less efforts and learning in order to resolve exam exercises which can finally lead to lower cheating rates. Furthermore, it is also possible that enthusiastic teachers are perceived as role models by the students (Frenzel et al., 2009) and students do not want to be unfair with their role models by cheating during the assignment of someone they highly appreciate. If a student has several enthusiastic teachers (s)he does not intend to be unfair with these teachers in terms of cheating. However, if we consider the emotional contagion theories (Hatfield et al., 1994), it might be possible that the intrinsic motivation of teachers raises the interest of students in a given material and this way the intrinsic motivation will mediate between teacher enthusiasm and lower cheating rates. Consequently, students will make more efforts and spend more time with learning if they have a lot of enthusiastic teachers and as a consequence of this behavior, students will cheat less as a whole at the end of the semester.

First, (H1) we assume that if a student has a lot of teachers who are perceived to teach enthusiastically this higher proportion has a direct negative effect on academic dishonesty. Such teachers orient the attention of students during class activities (Bettencourt et al., 1983), hence students can more deeply encode the materials during class and they have to make less effort after school in order to learn the material. Another explanation for the direct negative link between aggregated teacher enthusiasm and student cheating is related to the more salient unfairness of cheating at a class with a teacher who is a role model due to her/his enthusiastic teaching behavior compared to others who are not perceived as role models (Frenzel et al., 2009).

Besides the direct relationships, (H2) we suppose that aggregated teacher enthusiasm (high proportion of enthusiastic teachers) can influence students' cheating behavior indirectly through their academic motivations. Previous studies found that higher intrinsic motivation reduces cheating, while amotivation increases it. In the present study we expect this relationship pattern (H2a). Regarding the link between students' cheating and extrinsic motivation, previous results are more ambiguous. In line with previous Hungarian results (Orosz et al., 2013), we expect no relationship between extrinsic motivation and cheating (H2b).

Considering the emotional contagion explanations, if the teacher is enthusiastic, the students' intrinsic motivation will increase (Hatfield et al., 1994) which will lead to lower cheating rates (Weiss et al., 1993; Anderman et al., 1998; Murdock et al., 2001; Orosz et al., 2013). We expect this mediated relationship pattern (H2c). However, to our best knowledge no prior results were found regarding the link between amotivation of students and teacher enthusiasm. However, we expect a negative link between amotivation and perceived and we expect that amotivation is positively related to students cheating based on the results of previous studies (Harding et al., 2004; Angell, 2006; Orosz et al., 2013; Park et al., 2013). Therefore, we expect this mediated relationship pattern (H2d).

Materials and Methods

Participants

Three hundred and forty two university students ($M = 224$, $F = 116$) participated in the study. The respondents' age was between 18 and 41 years; the average age was 22.11 (SD = 2.53). The students' GPA was 4.03 (SD = 0.70) in the previous semester. Regarding the education level of parents, 6.2% of mothers have a primary level of education, 48.2% the secondary-level, 42.9% have a college or university degree, while 2.6% of the mothers have other qualifications. Regarding the fathers, 5.6% have a primary level of education, 57.6% a secondary-level, 34.1% have a higher-education degree, while 2.6% of the fathers have other qualifications. Participants were informed about the content of the questionnaire, e.g., academic motivation, teachers' enthusiasm, and academic dishonesty. Respondents volunteered for the study and did not receive compensation for participation; moreover, students were assured of their anonymity. The research was conducted with an online questionnaire, filling this out lasted approximately 10 min, students were asked to respond as honestly as possible.

Variables and Measures

The first page of the questionnaire included demographic data regarding age, gender, qualifications of parents, and GPA from their last semester. The next section was intended to measure the academic motivation of the students. We used the Hungarian version (Orosz et al., 2013) of Vallerand et al.'s (1992) Academic Motivation Scale (AMS) for university samples. This scale was created to measure academic motivation at contextual level. The items appear as answers to the following question: Why do you go to college? This shorter version of AMS contained three factors: amotivation, extrinsic, and intrinsic motivation. The response choices for these items were rated on a 7-point Likert scale (1 = does not correspond at all; 2–3 = corresponds a little; 4 = corresponds moderately; 5–6 = corresponds a lot; and 7 = corresponds exactly). The reliability in terms of internal consistency was acceptable ($\alpha_{\text{intrinsic motivation to know}} = 0.86$; $\alpha_{\text{extrinsic motivation external regulation}} = 0.80$; $\alpha_{\text{amotivation}} = 0.87$).

The second questionnaire measured academic cheating. We used the slightly modified Hungarian version of McCabe and Trevino's (1993) Academic Dishonesty Scale, which contained 10 items. The respondents had to rate each item using a 5-point Likert scale (1 = "never"; 2 = "one or two times"; 3 = "three–five times"; 4 = "six–ten times"; 5 = "more than 10 times") and had to indicate how many times they used different forms of cheating in the previous semester. The reliability in terms of internal consistency was acceptable ($\alpha_{\text{cheating}} = 0.84$).

In the next section, we aimed to measure perceived aggregated enthusiasm of teachers using Sanders and Gosenpud's (1986) work-enthusiasm questionnaire, which contains 13 items. We used the same items as in the Study 1 (see **Table 1**.). However, students rated differently these items: they were instructed to indicate on an 11-point scale that out of 10 teachers how many of their teachers can be characterized on the basis of each item concerning their enthusiastic teaching behavior during class (0 – none of them, 1 – 1 out of 10, etc.). Therefore, in this case we measured the proportion of teachers concerning each item they have by using the modified version of Sanders and Gosenpud's (1986) enthusiasm scale—interpreting it as an aggregated perceived enthusiasm. This sort of measurement can allow the investigation of the relationship pattern of the enthusiasm items (i.e., if a student has a lot of enthusiastic teachers she/he will give consequently higher scores in the case of items 7–13 and lower scores in the case of items 1–6). We chose this unusual form of measurement for two reasons. First, the AMS grasps academic motivations (Vallerand et al., 1992) and the McCabe and Trevino Academic Dishonesty Scale (McCabe and Trevino, 1993) grasps cheating in a contextual, school level (see Vallerand and Ratelle, 2002). This contextual level means that students fill out the questionnaire concerning not specific classes but at the level of school. Concerning AMS students reply to the question of AMS "Why do you go to school?"; concerning the used cheating scale they report overall cheating concerning last semester. Dissimilarly to previous studies (Kunter et al., 2008, 2013) we did not intend to ask teachers' self-reports concerning their own enthusiasm (see Footnote 1). Furthermore, dissimilarly to other research (Patrick et al., 2000) we did not intend to ask students perceived enthusiasm at a lower, more situational level by asking the perceived enthusiasm of specific teachers during specific courses because it would have been incompatible with the measurement level of both the AMS and the McCabe and Trevino's cheating measure. The second reason is the following. If we measure teacher enthusiasm at a course-specific (or teacher-specific) level we should also do the same with the motivations and the cheating. We were afraid of the lack of reliability of the student responses if we ask them about their course specific cheating. Very probably, students would be very suspicious if they are asked concerning whether they turned in work done by someone else concerning their Introduction to psychology course. Despite cheating occurrence per semester is high in Hungary (Orosz et al., 2013), very probably if cheating is asked concerning specific courses, problems of social desirable responding would appear in a much larger extent compared to the case if students are asked about their aggregated frequency of cheating concerning their last semester. In the case of this sort of measurement the reliability in terms of internal consistency was high regarding both enthusiastic items ($\alpha_{\text{items}7-13} = 0.92$) and non-enthusiastic items ($\alpha_{\text{items}1-6} = 0.86$).

The study was conducted in accordance with the Declaration of Helsinki. All procedures were carried out with the adequate understanding and consent of the participants and with the approval of Eötvös Loránd University.

Data Analysis

The statistical analyses were performed by the SPSS version 15 and Amos version 17. Path analyses were conducted on covariance matrices, and the solutions were generated by ML estimation. Based on Brown (2012), several goodness of fit indices were included: chi-square degree of freedom ratio (chi-square/df), comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root mean square error of approximation (RMSEA). Following Hu and Bentler's (1999) suggestions, acceptable model fit was defined by the following criteria: CFI ($\geq$0.95), TLI ($\geq$0.95) and RMSEA ($\leq$0.06).

Results

To our best knowledge, no previous studies examined the joint impact of teachers' enthusiasm and students' academic motivation in relation to academic cheating. Therefore, we intended to explore how teachers' enthusiasm and the different types of academic motivation are connected to students' academic cheating. Moreover, we intended to investigate the direct and indirect influence of the observed variables. We expected, on the basis of the correlations and the theoretical background, that the exploratory path model would reveal (1) the direct effect of teachers' enthusiasm and lack of enthusiasm on students' academic cheating behavior, and (2) the indirect effects of aggregated teacher enthusiasm and lack of enthusiasm through students' academic motivation to students' academic dishonesty.

Structural equation modeling (SEM) was used to explore the relationship pattern of academic cheating, students' academic motivation, and the perceived aggregated enthusiasm of teachers. Parcels were used as indicators of academic cheating and aggregated teacher enthusiasm, because the variables contained too

many items. We found justifiable using parcels because the scales (academic cheating and enthusiasm) were theoretically unidimensional (Bandalos and Finney, 2001). Furthermore, previous studies used this method can be used in the case if there are several latent variables (i.e., Carbonneau et al., 2008).

We used factorial algorithm on the basis of Rogers and Schmitt (2004). In this algorithm we computed parcels on the basis of exploratory factor analysis which resulted in factor loadings. In the case of both the academic cheating measure and the enthusiasm measure each parcel sequentially took up the items with the highest to the lowest factor loadings by alternating the direction of item-choosing turns through the parcels. For cheating, we aggregated Items 6 and 3 into Parcel 1, Items 9 and 7 into Parcel 2, Items 10 and 2 into Parcel 3, Items 5 and 8 into Parcel 4 and Items 4 and 1 into Parcel 5. The teachers' enthusiasm variable contains two components: one of the components refers to teachers' enthusiastic behavior; the other refers to teachers' non-enthusiastic behavior. For the enthusiasm component, we aggregated Items 9 and 7 into Parcel 1, Items 12 and 8 into Parcel 2 and Items 13, 10 and 11 into Parcel 3. For the non-enthusiasm component, we aggregated Items 5 and 1 into Parcel 1, Items 4 and 2 into Parcel 2 and Items 3 and 6 into Parcel 3. The non-enthusiastic component was represented more ($\beta = 0.56$, $p < 0.001$) in the total teachers' enthusiasm factor, while the enthusiastic factor explained a smaller amount of the variance of it ($\beta = -0.32$, $p < 0.001$).

Several models were tested.[2] Here, only the final best fitting model is presented in **Figure 1** with standardized estimates.

[2]Alternative models are available upon request.

According to the final model [χ^2 (130, $N = 340$) = 309.635, $p < 0.001$ ($\chi^2/df = 2.382$), CFI = 0.948, TLI = 0.939, RMSEA = 0.064], only lack of teachers' perceived enthusiasm ($\beta = 0.45$, $p < 0.001$) had direct effect on self-reported academic cheating ($R^2 = 20.0\%$). Furthermore, lack of teacher enthusiasm had a direct effect on both intrinsic motivation ($\beta = -0.51$, $p < 0.001$) and amotivation ($\beta = 0.67$, $p < 0.001$). However, neither motivation mediated the effect of teacher enthusiasm concerning students' cheating. These results are in line with our first hypothesis (H1): namely, teachers' perceived enthusiasm has a direct effect on self-reported cheating. However, the second hypothesis (H2) was not confirmed because neither intrinsic motivation, nor amotivation had a direct effect. Furthermore, in line with previous results, extrinsic motivation was not linked to cheating and it was also unrelated to teachers' enthusiasm. In sum, the more teachers are perceived enthusiastic the less cheating is reported among university students.

Discussion

This exploratory study investigated whether lack of teachers' perceived enthusiasm could have an effect on academic cheating. Our results suggest that without the mediation of academic motivations, the number of teachers who are perceived to be enthusiastic is negatively related to cheating rates. This effect could have multiple explanations. First, based on Frenzel et al.'s (2009) explanation, we can assume that enthusiastic teachers can serve as role models for students. Therefore, when students decide about cheating or being honest during an assignment, they are more likely to choose honesty, because they might consider

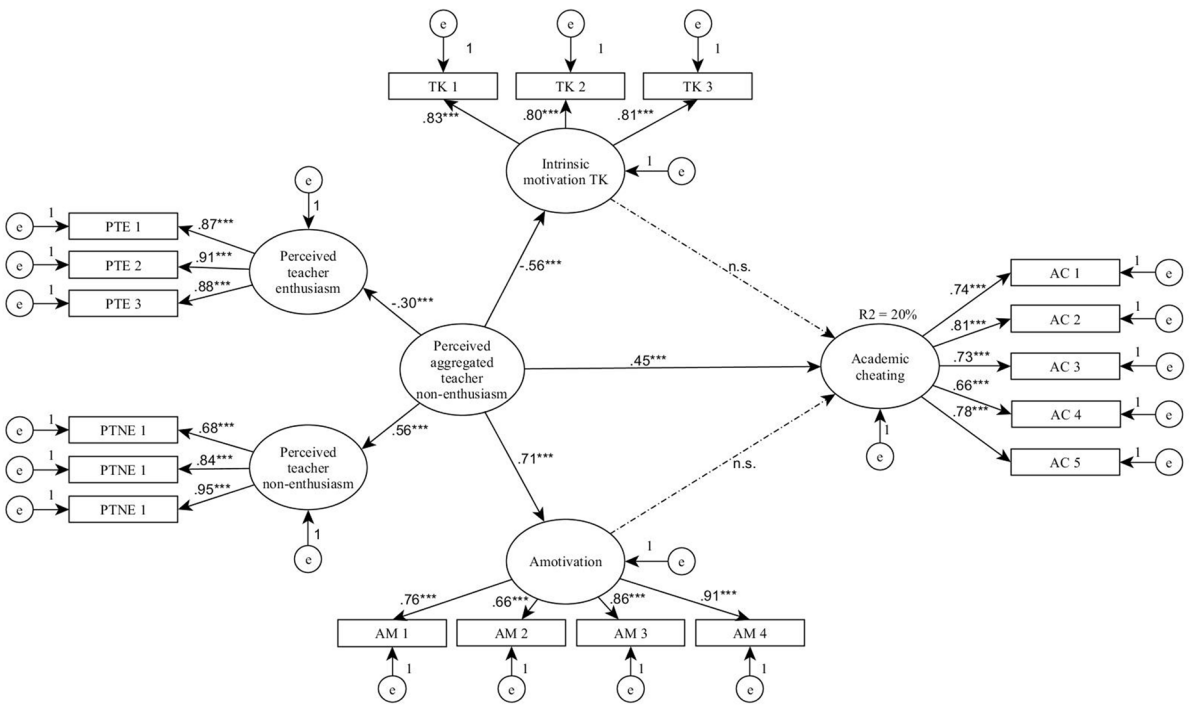

FIGURE 1 | Results of the structural equation modeling. Statistical significance: ***$p < 0.001$; n.s., not significant result; TK, to-know; AM, amotivation; PTE, perceived teacher enthusiasm; PTNE, perceived teacher non-enthusiasm; AC, academic cheating.

cheating against that teacher unfair. If they have a lot of enthusiastic teachers they will cheat less during the exams. Another possible explanation is that teachers with enthusiastic behavior can orient the attention to the material more easily (Bettencourt et al., 1983), thus the students can learn it during class. If they can learn the material more easily thanks to the enthusiastic teaching behavior of the teacher, they have to study less for the exam (they have to make less effort) in order to get an appropriate result, which can finally lead to lower cheating rate.

Our second goal (H2) was to identify the possible indirect effects of the lack of teachers' enthusiasm on students' academic cheating behavior through the academic motivations of the students[3]. Interestingly, (H2a and H2b) no link has been found between the different types of motivation and self-reported academic cheating. Orosz et al. (2013) found that extrinsic motivation is not related to cheating, whereas intrinsic motivation and amotivation correlated with cheating. Harding et al. (2004), Angell (2006), and Park et al. (2013) also found that amotivation is an important predictor of cheating. Our analysis confirms that extrinsic motivation does not have any influence on cheating which means that the relationship between the two constructs does not appear to be as clear as previous studies (Weiss et al., 1993; Anderman et al., 1998; Murdock et al., 2001) have found. However, contrary to previous results (Orosz et al., 2013), we found that neither intrinsic motivation, nor amotivation had a significant direct effect on academic cheating if we include teacher enthusiasm in the same model. The consensus regarding links between academic motivations and academic cheating seems to be widespread (Anderman and Murdock, 2007). However, aggregated teacher enthusiasm might be one of the important background interpersonal variables behind intrapersonal motivations such as amotivation or intrinsic motivation. This result is in line with McCabe and Trevino's (1997) claim that contextual elements are more important than individual ones in the context of academic cheating and it is also compatible with Whitley's (1998) meta-analysis which pointed out that individual factors are less important than interpersonal, situational predictors.

On the other hand, (H2c and H2d) teachers' lack of enthusiasm had a negative direct effect on intrinsic motivation and a positive direct effect on amotivation. These results can be explained by the emotional contagion theories (Hatfield et al., 1994). According to our results encountering a lot of enthusiastic, intrinsically motivated teachers can raise the interest of the students in a given material and this way it increases their intrinsic motivation. However, besides the motivation-related beneficial effect of teacher enthusiasm, cheating is not only decreasing because of the heightened intrinsic motivation but also other reasons which require further investigations.

[3]As noted previously, it is possible that with their enthusiastic behavior, teachers can increase students' intrinsic motivation (Patrick et al., 2000). Moreover, students with increased intrinsic motivation are likely to cheat less than their extrinsically motivated or amotivated classmates (Anderman et al., 1998; Murdock et al., 2001; Orosz et al., 2013).

It is important to note that similarly to other research, this one also has limitations. First, we have to mention that it is a cross-sectional study. Respondents had to answer through the Internet which can always raise questions about the real identity of the respondent. However, on the other side, it can reduce the social desirability bias. Second, we measured only one type of mediator variable in terms of academic motivations. However, further studies should explore other relevant teaching-related variables. Teacher enthusiasm may involve diverse teacher characteristics. In order to separate these characteristics from teacher enthusiasm it would be fruitful to discriminate enthusiasm from such behaviors. One of these characteristics might be mastery-oriented teaching. In further studies it would be important to measure separate effect of perceived mastery-oriented teaching from teacher enthusiasm. Moreover, we have no information about the incompletion rate. Students of different institutions have participated in this research but the sample is not representative to the country as it only includes university students, but not elementary and high school students. It also has to be mentioned that both the AMS and the scale measuring teachers' enthusiasm might need further evaluation and examination.

Furthermore, different forms of cheating could be separated in future studies, for instance copying from other students, plagiarism or usage of cheat sheets. It would be useful to reveal what other teacher-related factors—both individual and contextual—could possibly influence students' academic dishonesty and how they exert their influence on this variable. Furthermore, it is possible that not only very visible forms of enthusiasm matter. Our scale included very salient behavioral forms of teacher enthusiasm. However, more tacit cues could be as important as the visible ones.

Conclusion

The lack of teacher enthusiasm appears to diminish the effect of academic motivations on students' self-reported cheating behavior. Simultaneously, relatively strong negative link was found between the number of not enthusiastic teachers and the students' intrinsic motivation and similarly strong positive link was found between amotivation and the low number of enthusiastic teachers. Consequently, this study showed that if a student has a very few enthusiastic teachers, (s)he will not only have reduced intrinsic motivation, but (s)he might more easily become amotivated. Besides all of these negative consequences, these students also report higher cheating rate. These results are in line with previous reviews and meta-analyses (McCabe and Trevino, 1997; Whitley, 1998) which claim that situational and interpersonal variables are more important regarding student cheating than individual differences such as academic motivations.

General Discussion

Many predictors of academic cheating were explored previously (Whitley, 1998). These predictors can be categorized into three main categories: individual differences, situational and interpersonal variables, and cultural effects (Orosz, 2010). During several years among intra-individual variables academic motivations and

academic goals were examined as key predictors of cheating (Anderman and Murdock, 2007). According to Whitley's (1998) meta-analysis, situational and interpersonal variables appeared to have the largest effect on cheating. Among these variables we can emphasize the role of teacher who creates a given context in which cheating can appear. Besides individual differences and situational (interpersonal) variables, only a few empirical studies examined systematically the effect of culture on cheating behavior (Grimes, 2004; Teixeira and Rocha, 2010). These broader societal-level value-related variables can also influence the situational level, and consequently the behavior of teacher, which provides the proximal context of cheating. In the first study, on the basis of self-reports we found that teacher enthusiasm as a situational (interpersonal) variable matters in academic cheating.

Previous studies showed that the student–teacher relationship has to be taken into account in relationship with academic cheating. Students cheat less if the teacher is perceived to be friendly, motivated, engaged, and who gives an interesting lecture (Genereux and McLeod, 1995; McCabe, 1999; Murdock et al., 2001). If we take a closer look on the Enthusiasm items generated on the basis of Sanders and Gosenpud (1986) the dimension of friendliness (including reversed items) appears in items 3(R), 4(R), 6(R), 8, 11, and 13; motivation or its opposite appears in items 4(R), 6(R), 7, 9, 12, and 13; engagement appears in all items, and interesting lecture appears in items 3(R), 7, 8, and 11. Therefore, teacher enthusiasm can be a compound of these previously explored variables which has negative effect on cheating.

All of the above-mentioned teacher characteristics and behavior is linked to students' academic motivation and their academic goals. Previous studies found that intrinsic motivation and mastery goal orientation negatively related to cheating (Weiss et al., 1993; Anderman et al., 1998; Pulvers and Diekhoff, 1999; Wryobeck and Whitley, 1999; Jordan, 2001; Anderman and Murdock, 2007). Whereas, some studies showed that extrinsic forms of motivation are positively related to cheating (Anderman and Murdock, 2007), others—similarly to the present results (H2b)—found no link between cheating and extrinsic motivation (Orosz et al., 2013). Only a few study examined the link between amotivation and cheating and they found positive link between this form of motivation and self-reported cheating (Orosz et al., 2013). As Anderman and Murdock (2007) showed that student motivations do not exist in a vacuum, but in a certain classroom climate. This climate can be affected fundamentally by the enthusiasm of the teachers. Study 2 showed that the more enthusiastic teachers students have, the less they cheat (H1). Furthermore, if students see the most of their teachers enthusiastic they are intrinsically motivated (H2a) and they are not amotivated (H2a). Therefore, in line with previous results (Patrick et al., 2000) teacher enthusiasm is among the most important variables which are linked to students' intrinsic motivation: the number of enthusiastic teachers explains a relatively large amount of variance of both intrinsic motivation and amotivation.

However, on the basis of the results of Study 2 we could see that link between aggregated teacher enthusiasm and academic cheating is not mediated by either intrinsic motivation (H2c) or by amotivation (H2d). (Neither cheating, nor aggregated enthusiasm was related to extrinsic motivation.) In the present model, the lack of link between motivation and cheating can be attributed to a background variable (overall enthusiasm of teachers) which appears to be one of the important sources of student motivation, and which diminishes the link between motivations and cheating. The question arises: what can be the mechanism through perceived aggregated enthusiasm explains directly 20 percent of the variance of students' cheating. Keller et al. (2013) mention three main explanations: the attention commanding one (Bettencourt et al., 1983), the role-model one (Frenzel et al., 2009), and the enthusiasm contagion one (Hatfield et al., 1994). The first and second studies can hardly define the unique role of these explanations. Taking into account the content of enthusiasm items, enthusiastic teachers can draw the attention of students, they can be role models, and the contagion can also occur. Possibly, all of these effects can simultaneously lead to less cheating. Besides these effects it is possible that enthusiastic teachers behave differently not only during courses but during exams compared to less enthusiastic teachers. It is possible that enthusiastic teachers survey more carefully exams, update the exam questions year by year, ask more questions during exams which need more thinking and less material to memorize, and they can create other ways exam situations (by providing sitting order) in which students can hardly cheat. In sum, it is possible that enthusiastic teachers do their best not only during class but during exams, as well. Besides these explanations it is possible that enthusiastic teachers are also perceived as teachers who make a lot efforts in order to do their best during classes (and exams), students might feel unfair cheating against some who does his/her job conscientiously. In sum, further studies are needed in order to separate how the above mentioned mechanisms of teacher enthusiasm influence cheating. The background variable behind motivations can be the teacher enthusiasm. However, it is possible to suppose that behind perceived enthusiasm exam-related specific behaviors can be supposed which can be explained by "classical" interpersonal variables as risk of detection, expected punishment, or sitting order, etc.

It was an Eastern-European research. According to previous results (Grimes, 2004; Teixeira and Rocha, 2010; Orosz et al., 2013) in Eastern-European countries cheating rates are higher compared to other Western European countries, US students and Asian students. Therefore, potential variables which have impact on academic cheating can be culture-specific. Maybe in other cultures perceived enthusiasm has smaller or larger effect on cheating than in the Eastern-European context. Further cross-cultural examination is needed in order to explore these effects. Maybe perceived teacher enthusiasm can be dissimilar in different cultures which is linked to the teachers' own evaluation on their societal-level reputation or socioeconomic status. Maybe in such countries where teachers are less overloaded, they appear to be more enthusiastic than in countries in which they have more compulsory work.

Besides the culture-specificity, several limitations can be mentioned regarding the two studies. The first study was based on self-reports, it was based on perceived enthusiasm which derives from the evaluation of students. In this study one item indicated only one teacher. Furthermore, their responses relied on their

memory recollection from last year. There might be distortion concerning the details. Despite the potential distortions, it seems that the magnitude of self-reported cheating occurrence differences were visible. Finally, the first study was descriptive which without in-depth statistical analysis provided only guidelines for further research. The second study was also based on self-reports. Regarding the path model, in the analysis we used parcels in order to reduce the complexity of the model. We used the three factor version of Vallerand et al.'s (1992) the AMS which showed good model fit in the case of previous Hungarian studies (Orosz et al., 2013). Similarly to the first study, we did not have data from self-perception of teachers which could allow measuring the discrepancies between how students perceive their teachers enthusiasm and how teachers perceive their own enthusiasm. We did not measure either in the first or in the second study directly the cheating behavior of the students. Finally, study two provided aggregated information concerning both several teachers and several forms of teaching. This study does not provide information concerning the effect of specific forms of cheating during the exams of specific teachers, but an overall evaluation in terms of perceived enthusiasm climate and various forms of cheating.

The present research has two main practical implications. If students have many enthusiastic teachers they cheat less. Furthermore, similarly to other studies, perceived aggregated teacher enthusiasm is positively related to intrinsic motivation and negatively related to amotivation. Consequently, it is important to keep teachers enthusiastic concerning their subject and instructional activities. It is especially true if we keep motivated the whole teaching staff. Despite its powerful positive impact, to our best knowledge no prior study examined the long term effect of enthusiasm specific interventions.

Conclusion

The present research aimed to measure the effect of teacher enthusiasm on self-reported cheating. The results suggest that aggregated teacher enthusiasm is related to self-reported academic cheating independently from motivations (intrinsic motivation, extrinsic motivation, amotivation). The questionnaire results support the main conclusion which is enthusiasm matters in cheating. However, the underlying mechanisms through which enthusiasm reduce cheating is still unexplored. Further studies are required in order to support the relevance of the three main (and other alternative) hypothesis (attention command, role-model, contagion). Further research is needed to explore the further potential positive effects of enthusiasm interventions among teachers and other professionals.

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References

Anderman, E. M., Griesinger, T., and Westerfield, G. (1998). Motivation and cheating in early adolescent. *J. Educ. Psychol.* 90, 84–93. doi: 10.1037/0022-0663.90.1.84

Anderman, E. M., and Murdock, T. (2007). *Psychology of Academic Cheating*. San Diego, CA: Elsevier.

Angell, L. R. (2006). The relationship of impulsiveness, personal efficacy, and academic motivation to college cheating. *Coll. Stud. J.* 40, 118–131.

Bandalos, D. L., and Finney, S. J. (2001). "Item parceling issues in structural equation modeling," in *New Developments and Techniques in Structural Equation Modeling,* eds G. A. Marcoulides and R. E. Schumacker (Mahwah, NJ: LEA), 269–296.

Bettencourt, E. M., Gillett, M. H., Gall, M. D., and Hull, R. E. (1983). Effects of teacher enthusiasm training on student on-task behavior and achievement. *Am. Educ. Res. J.* 20, 435–450. doi: 10.3102/00028312020003435

Brickman, W. W. (1961). Ethics, examinations, and education. *Sch. Soc.* 89, 412–415.

Brigham, F. J., Scruggs, T. E., and Mastropieri, M. A. (1992). Teacher enthusiasm in learning disabilities classrooms: effects on learning and behavior. *Learn. Disabil. Res. Pract.* 7, 68–73.

Brophy, J. (2006). "History of research on classroom management," in *Handbook of Classroom Management: Research, Practice, and Contemporary Issues,* eds E. Emmer, E. Sabrione, C. M. Everston, and C. S. Weinstein (New York, NY: Routledge), 17–43.

Brophy, J. E., and Good, T. L. (1986). "Teacher behavior and student achievement," in *Handbook of Research on Teaching,* 3 Edn, ed. M. Wittrock (New York: Macmillan), 328–375.

Brown, T. A. (2012). *Confirmatory Factor Analysis for Applied Research*. New York, NY: Guilford Press.

Carbonneau, N., Vallerand, R. J., Fernet, C., and Guay, F. (2008). The role of passion for teaching in intrapersonal and interpersonal outcomes. *J. Educ. Psychol.* 100, 977–987. doi: 10.1037/a0012545

Cochran, J. K., Chamlin, M. B., Wood, P. B., and Sellers, C. S. (1999). Shame, embarrassment, and formal sanction threats: extending the deterrence/rational choice model to academic dishonesty. *Sociol. Inq.* 69, 91–105. doi: 10.1111/j.1475-682X.1999.tb00491

Collins, M. L. (1978). Effects of enthusiasm training on preservice elementary teachers. *Res. Teach. Educ.* 29, 53–57. doi: 10.1177/002248717802900120

Deci, E. L., and Ryan, R. (1985). *Intrinsic Motivation and Self-Determination in Human Behavior*. New York, NY: Plenum Press. doi: 10.1007/978-1-4899-2271-7

Deci, E. L., Vallerand, R. J., Pelletier, L. G., and Ryan, R. M. (1991). Motivation and education: the self-determination perspective. *Educ. Psychol.* 26, 325–346. doi: 10.1080/00461520.1991.9653137

Ehrlich, E. H., Flexner, S. B., Carruth, G., and Hawkins, J. M. (1980). *Oxford American Dictionary*. New York, NY: Oxford University Press.

Frenzel, A. C., Goetz, T., Lüdtke, O., Pekrun, R., and Sutton, R. E. (2009). Emotional transmission in the classroom: exploring the relationship between teacher and student enjoyment. *J. Educ. Psychol.* 101, 705–716. doi: 10.1037/a0014695

Garavalia, L., Olson, E., Russell, E. B., and Christensen, L. (2007). "How do students cheat?" in *Psychology of Academic Cheating,* eds E. M. Anderman and T. B. Murdock (San Diego, CA: Elsevier), 33–55. doi: 10.1016/B978-012372541-7/50004-8

Genereux, R. L., and McLeod, B. A. (1995). Circumstances surrounding cheating: a questionnaire study of college students. *Res. High. Educ.* 36, 687–704. doi: 10.1007/BF02208251

Grimes, P. W. (2004). Dishonesty in academics and business: a cross-cultural evaluation of student attitudes. *J. Bus. Ethics* 49, 273–291. doi: 10.1023/B:BUSI.0000017969.29461.30

Haerens, L., Aelterman, N., Van den Berghe, L., De Meyer, J., Soenens, B., and Vansteenkiste, M. (2013). Observing physical education teachers' need-supportive interactions in classroom settings. *J. Sport Exerc. Psychol.* 35, 3–17.

Harding, T. S., Carpenter, D. D., Finelli, C. J., and Passow, H. J. (2004). Does academic dishonesty relate to unethical behavior in professional practice? An exploratory study. *Sci. Eng. Ethics* 10, 311–324. doi: 10.1007/s11948-004-0027-3

Hatfield, E., Cacioppo, J. T., and Rapson, R. L. (1994). *Emotional Contagion*. New York, NY: Cambridge University Press.

Hetherington, E. M., and Feldman, S. E. (1964). College cheating as a function of subject and situational variables. *J. Educ. Psychol.* 55, 212–218. doi: 10.1037/h0045337

Hu, L., and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct. Equ. Modeling* 6, 1–55. doi: 10.1080/10705519909540118

Jordan, A. E. (2001). College student cheating: the role of motivation, perceived norms, attitudes, and knowledge of institutional policy. *Ethics Behav.* 11, 233–247. doi: 10.1207/S15327019EB1103_3

Keller, M. (2011). *Teacher Enthusiasm in Physics Instruction*. Doctoral dissertation, Didaktik der Physik, Fakultät für Physik, Universität Duisburg-Essen, Essen.

Keller, M., Neumann, K., and Fischer, H. E. (2013). "Teacher enthusiasm and student learning," in *International Guide to Student Achievement*, eds J. Hattie and E. M. Anderman (New York, NY: Routledge), 247–249.

Kunter, M., Frenzel, A., Nagy, G., Baumert, J., and Pekrun, R. (2011). Teacher enthusiasm: dimensionality and context specificity. *Contemp. Educ. Psychol.* 36, 289–301. doi: 10.1016/j.cedpsych.2011.07.001

Kunter, M., Klusmann, U., Baumert, J., Richter, D., Voss, T., and Hachfeld, A. (2013). Professional competence of teachers: effects on instructional quality and student development. *J. Educ. Psychol.* 105, 805–820. doi: 10.1037/a0032583

Kunter, M., Tsai, Y., Klusmann, U., Brunner, M., Krauss, S., and Baumert, J. (2008). Students' and mathematics teachers' perceptions of teacher enthusiasm and instruction. *Learn. Instr.* 18, 468–482. doi: 10.1016/j.learninstruc.2008.06.008

Land, M. L. (1980). Joint effects of teacher structure and teacher enthusiasm on student achievement. *Paper Presented at the Annual Meeting of the Southwest Educational Research Association,* San Antonio, Texas, TX.

Ma, Y., McCabe, D. L., and Liu, R. (2013). Students' Academic cheating in Chinese universities: prevalence, influencing factors, and proposed action. *J. Acad. Ethics* 11, 169–184. doi: 10.1007/s10805-013-9186-7

Marlin, J. W. Jr. (1991). State-mandated economic education, teacher attitudes, and student learning. *J. Econ. Educ.* 22, 5–14. doi: 10.1080/00220485.1991.10844693

McCabe, D. L. (1999). Academic dishonesty among high school students. *Adolescence* 34, 681–687. doi: 10.1006/ceps.2001.1088

McCabe, D. L. (2005). Cheating among college and university students: a North American perspective. *Int. J. Educ. Integr.* 1, 1–11.

McCabe, D. L., and Trevino, L. K. (1993). Academic dishonesty: honor codes and other contextual influences. *J. High. Educ.* 64, 522–538. doi: 10.2307/2959991

McCabe, D. L., and Trevino, L. K. (1997). Individual and contextual influences on academic dishonesty: a multicampus investigation. *Res. High. Educ.* 38, 379–396. doi: 10.1023/A:1024954224675

Meece, J. L., Anderman, E. M., and Anderman, L. H. (2006). Classroom goal structure, student motivation, and academic achievement. *Annu. Rev. Psychol.* 57, 487–503. doi: 10.1146/annurev.psych.56.091103.070258

Murdock, T. B., Hale, N. M., and Weber, M. J. (2001). Predictors of cheating among early adolescents: academic and social motivations. *Contemp. Educ. Psychol.* 26, 96–115. doi: 10.1006/ceps.2000.1046

Orosz, G. (2010). *Social Representation of Competition, Fraud and Academic Cheating of French and Hungarian Citizens.* Doctoral dissertation, University of Reims, Champagne-Ardenne.

Orosz, G., Farkas, D., and Roland-Lévy, C. (2013). Are competition and extrinsic motivation reliable predictors of academic cheating? *Front. Psychol.* 4:87. doi: 10.3389/fpsyg.2013.00087

Paoloni, P. V. R. (2014). Emotions in academic contexts. Theoretical perspectives and implications for educational practice in college. *Electr. J. Res. Educ. Psychol.* 12, 567–596.

Park, C. (2003). In other (people's) words: plagiarism by university students - literature and lessons. *Assess. Eval. High. Educ.* 28, 471–488. doi: 10.1080/02602930301677

Park, E., Park, S., and Jang, I. (2013). Academic cheating among nursing students. *Nurse Educ. Today* 33, 346–352. doi: 10.1016/j.nedt.2012.12.015

Patrick, B. C., Hisley, J., and Kempler, T. (2000). "What's everybody so excited about?": the effects of teacher enthusiasm on student intrinsic motivation and vitality. *J. Exp. Educ.* 68, 217–236. doi: 10.1080/00220970009600093

Pulvers, K., and Diekhoff, G. M. (1999). The relationship between academic dishonesty and college classroom environment. *Res. High. Educ.* 40, 487–498. doi: 10.1023/A:1018792210076

Reynolds, W. M., and Gerbasi, K. C. (1982). Development of reliable and valid short forms of the MCSDS. *J. Clin. Psychol.* 38, 119–125. doi: 10.1002/1097-4679(198201)38:1<119::AID-JCLP2270380118>3.0.CO;2-I

Rogers, W. M., and Schmitt, N. (2004). Parameter recovery and model fit using multidimensional composites: a comparison of four empirical parceling algorithms. *Multivariate Behav. Res.* 39, 379–412. doi: 10.1207/S15327906MBR3903_1

Rosenshine, B. (1970). Enthusiastic teaching: a research review. *School Rev.* 78, 499–514. doi: 10.1086/442929

Sanders, P., and Gosenpud, J. (1986). Perceived instructor enthusiasm and student achievement. *Dev. Bus. Simul. Exp. Excerc.* 13, 52–55.

Stewart, R. A. (1989). Interaction effects of teacher enthusiasm and student note-taking on recall and recognition of lecture content. *Commun. Res. Rep.* 6, 84–89. doi: 10.1080/08824098909359838

Stronge, J. H., Tucker, P. D., and Hindman, J. L. (2004). *Handbook for Qualities of Effective Teachers*. Houston, TX: ASCD.

Teixeira, A. A. C., and Rocha, M. F. (2010). Cheating by economics and business undergraduate students: an exploratory international assessment. *High. Educ.* 59, 663–701. doi: 10.1007/s10734-009-9274-1

Tibbetts, S. G. (1999). Differences between women and men regarding decisions to commit test cheating. *Res. High. Educ.* 40, 323–342. doi: 10.1023/A:1018751100990

Vallerand, R. J., Pelletier, L. G., Blais, M. R., Briére, N. M., Senécal, C., and Valliéres, E. F. (1992). The academic motivation scale: a measure of intrinsic, extrinsic and amotivation in education. *Educ. Psychol. Meas.* 52, 1003–1017. doi: 10.1177/0013164492052004025

Vallerand, R. J., and Ratelle, C. F. (2002). Intrinsic and extrinsic motivation: a hierarchical model. *Handb. Self Determination Res.* 128, 37–63.

Weiss, J., Gilbert, K., Giordano, P., and Davis, S. F. (1993). Academic dishonesty, type A behavior, and classroom orientation. *Bull. Psychon. Soc.* 31, 101–102. doi: 10.3758/BF03334151

Whitley, B. E. (1998). Factors associated with cheating among college students: a review. *Res. High. Educ.* 39, 235–274. doi: 10.1023/A:1018724900565

Williams, R. G., and Ware, J. E. (1976). Validity of student ratings of instruction under different incentive conditions: a further study of the Dr. Fox effect. *J. Educ. Psychol.* 68, 48–56. doi: 10.1037/0022-0663.68.1.48

Williams, R. G., and Ware, J. E. (1977). An extended visit with Dr. Fox: validity of student satisfaction with instruction ratings after repeated exposures to a lecturer. *Am. Educ. Res. J.* 14, 449–457. doi: 10.3102/00028312014004449

Wong, H. K., and Wong, R. T. (2001). *The Effective Teacher*. Mountain View, CA: Harry K. Wong Publishing Company.

Wryobeck, J. M., and Whitley, B. E. Jr. (1999). Educational value orientation and peer perception of cheaters. *Ethics Behav.* 9, 231–242. doi: 10.1207/s15327019eb0903_4

Wyckoff, W. L. (1973). The effect of stimulus variation on learning from lecture. *J. Exp. Educ.* 41, 85–90. doi: 10.1080/00220973.1973.11011415

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