A 'Social Identity Approach' as a Theory for the Design of Learning with Educational Technology: The Case of Clickers

Nicholas Bowskill, University of Derby, Vic Lallly, University of Glasgow

Email: *N.Bowskill@derby.ac.uk* *V.Lallly@glasgow.ac.uk*

Abstract

This article explores learning design initially focussing upon clickers, a polling technology used largely in the classroom. We develop that to consider learning design focused at the level of the whole-group. We then apply this to education technologies in general.

One distinctive contribution made here is to conceptualise clickers as a technology for groups to work as a group (collectively). To explore this, we consider two popular models for using clickers. One of these is Peer Instruction (Mazur) which is by far the most used and well-known model. The other is SharedThinking (Bowskill) which is a more recent addition. We go on from there to explore group-relevant theory and seek to widen this to consider theory for learning design using many technologies.

Clickers are an under-theorised set of technologies and here is our second distinctive contribution in this paper. Researchers have called for '*empirical work to develop theory*' (Boscardin and Penuel, 2012) for this technology. An additional concern is that "*existing research does not connect to larger research on education or psychology*" (Penuel, Roschelle et al, 2004). We explore the possibility of a social identity approach (Bliuc et al., 2011, Haslam, 2004) as a theoretical tool for learning design in way which might address these concerns. We suggest learning design may benefit from a focus on the group-level of thinking as part of a technology-supported identity-mediated practice.

Interestingly, other researchers have argued for different mediators of learning to be considered when designing pedagogical practice. Technology and networks (Siemens, 2005), language (Wertsch, 1980, Vygotsky, 1978), activities and tools (Engeström, 2007) and communities (Wenger, 1998, Lave and Wenger, 1991, Roschelle et al., 2004) have all been used to inform pedagogy. This paper proposes the addition of '*identity-mediated group learning*' (Bowskill, 2017b) in which the situated group-identity provides the basis for development using a social identity approach.

Finally, one researcher describes the use of clickers as having a '*catalytic*' effect (Draper, 2009). Another notes the '*sense of community*' as an affective outcome arising from the use of this technology (Simon et al., 2013). In this paper, the suggestion is the 'catalytic' effect may be the moment of social identification when the group is made salient and deindividuation occurs. From this, we affirm the view elsewhere in the literature that '*reference to peers has more influence than reference to facts*' (Goldstein et al., 2008).

Keywords
Social identity, clickers, learning design, technology, pedagogy, learning theory.

Introduction

Communities of Practice (Wenger, 1998) has been a wonderful tool to help us develop our ideas of learning beyond the individual mind. As a concept, it has been widely adopted not least because it helps locate learning within the social and cultural realm. It helps us understand development from a relational perspective.

In terms of turning this concept into pedagogy, does the term 'Communities of Practice' risk becoming the new term for group-work? Collaborative learning and decisions to work as a community inform the way we use technology, based on Communities of Practice, but how much attention is given to the level of the community as a pedagogical focus?

If we were able to organise learning design to address the community level, questions remain. For instance, what are the psychological implications of a focus upon different levels within the community? And, staying

with our focus on learning design, how might one community relate to another pedagogically? How might we design learning to isolate and develop different levels of community?

This article locates this conversation within learning design for clickers, a polling technology used largely in the classroom. The term 'Clickers' is deployed as an umbrella term for a popular set of learning technologies used in many higher education classrooms. Software and hardware-based versions are used to enable individuals to cast a vote for an option in a multiple-choice question. Devices are used to transmit the individual choice to a receiver on the tutor's laptop. The votes, once aggregated by the software, are displayed on a large screen and the results are made 'public' in the classroom.

One distinctive contribution made here is to conceptualise clickers as a technology for groups to work collectively as a group. To explore this, we consider two popular models for using clickers. One of these is Peer Instruction (Mazur) which is by far the most used and well-known model. The other is SharedThinking (Bowskill) which is a more recent addition. We go on from there to apply group-relevant theory for learning design using any technology.

Clickers are an under-theorised set of technologies and here is our second distinctive contribution. Researchers have called for '*empirical work to develop theory' (Boscardin and Penuel, 2012)* for this technology. An additional concern is that "*existing research does not connect to larger research on education or psychology*" (Penuel, Roschelle et al, 2004). We explore the possibility of a social identity approach (Bliuc et al., 2011, Haslam, 2004) as a response to these concerns. We suggest this theoretical framework might be applied to learning design for many technology-supported practices.

This implies a shift from the sociological view of individuals in social contexts to one in which our focus is upon social groups in the mind of each individual member (Turner et al., 1987). It implies a corresponding shift away from seeing identity developed as a process solely within the individual (*personal* identity and the 'I' as the focus). We consider *social* identity as a distinctive context-sensitive view held within/across the group influencing thoughts, feelings and behaviour of members and their sense of self (the 'we' as the focus).

The work in this paper comes from empirical work completed at University of Glasgow (Bowskill, 2013). Supervision of the study was shared between Education (the home for the study), Psychology and Computing Science. The outcome of that research was to suggest the possibility of a Social Identity Approach as a theoretical candidate for designing learning with clickers. Another outcome was a new model developed for this technology called SharedThinking. We have been working since then to better understand the potential of a group-level view for theory, practice and learning design.

REVIEW OF CURRENT THEORY FOR CLICKERS

This family of technologies manages collaboration and activity at many levels. Individual, small group and collective levels of learning are *simultaneously* active in the classroom. Finding a learning theory to address all these different levels is therefore problematic. Which level should be the focus and what theoretical framework would be most appropriate to explain learning at any given level? Which might still acknowledge other levels involved?

Early discussions of theory, applied to this technology, have cited Constructivism and Social Constructivism as popular interpretive frameworks (Nicol and Boyle, 2003). Other theories have been proposed. In a recent review, six theories were identified (Chien et al, 2016). They were:

- *Novelty effect*
- *Unequal-item effect exposure*
- *Testing effect*
- *Adjunct question effect*
- *Feedback intervention effect*
- *(Self)-explanation effect*

A variety of alternative theories have been proposed for using clickers. They include Situated Motivation, Transformations in Participation and Mastery of Tools (Penuel et al., 2006). Generative Learning (Mayer et al., 2009) and Active Learning (Yaoyuneyong and Thornton, 2011).

Proceedings of the 11th International Conference on
Networked Learning 2018, Edited by: Bajić, M,
Dohn, NB, de Laat, M, Jandrić, P & Ryberg, T

ISBN 978-1-86220-337-2

400

Despite these theoretical developments, none seem to capture the simultaneous dynamic between the individual, social and collective aspects when using clickers. Few seem to respond to the call for work which builds upon established work in Education or Psychology. There is a feeling of 'patching' cognitive and sociocultural theories onto the technology.

DIFFERENT MODELS FOR USING CLICKERS

Basic use of this technology-family has tutors setting a multiple-choice question (MCQ) which includes a set of pre-determined answers. Students use clickers to vote for their preferred option. These votes are aggregated and then displayed on the screen to the whole class. Tutors can then respond accordingly with appropriate feedback.

Here we review 2 different models to show how practice has moved beyond this basic recipe. The first is Peer Instruction (Crouch and Mazur, 2001) as an example of peer-learning supported by the technology. The second is SharedThinking (Bowskill, 2017a, Bowskill et al., 2010a, Bowskill et al., 2010b, Bowskill et al., 2010c, Bowskill and Brindley, 2009) as an example of student-generated questions also involving peer-learning. We will argue that both models have an important whole-group element. This is under-researched and requires further theoretical work.

Peer Instruction as an example of a Peer-Learning Model

Peer Instruction is by far the most used and most cited model for using this technology. It is a form of peer-learning supported by clickers. Indeed, the addition of discussion to the use of this technology defines this model.

- Students vote on a multiple-choice question (MCQ) based on a key concept
- Students discuss and explain their choices to a peer
- Students vote again
- Tutor responds to the answers given

This provides 'rich feedback' (Kartsonaki et al., 2015) from multiple sources in the room. The tutor poses a question with fixed options. The students take a moment on their own to decide their preferred answer and vote accordingly. The results are displayed on the screen at the front of the class. Students have an opportunity to discuss their answers with a neighbour to convince each other or explain their decision. After a short period of time, students vote. Again, the results are displayed. The tutor then gives feedback on the outcomes.

Peer Instruction has been the focus of extensive research. It has been implemented in different courses, disciplines and institutions. Empirical research has shown this to be an effective pedagogical model using this technology.

SharedThinking as an example of a Student-Generated Collective Model

By way of contrast, a relatively new model for using clickers is SharedThinking (Bowskill, 2010, 2013). This also involves peer learning but rather than being tested on readymade concepts, the process is used to generate a conception within the group.

- Students are presented with an organising question as a framework
- Individuals write down their response
- Students work in small groups to produce a group-choice
- Small-groups' responses are added to the software under the framework question
- Individuals vote for their preferred choice
- Tutor responds

In SharedThinking, the class is given a question as an organising framework for the session. The task is to co-construct the question options. Students begin by working alone to record their personal response. Those personal views are then shared in small groups. Each small group discusses the pool of individual views and then chooses one item to share with the rest of the class. That choice is added to the voting software. Everyone in the class then votes for their personal choice. The process generates a digital representation of a group-concept.

Proceedings of the 11th International Conference on
Networked Learning 2018, Edited by: Bajić, M, 401
Dohn, NB, de Laat, M, Jandrić, P & Ryberg, T

ISBN 978-1-86220-337-2

A SOCIAL IDENTITY APPROACH AS A THEORETICAL FRAMEWORK

Social identities are distinct from personal identities. They are the sense of who we are as members of different social groups. Social identities include popular categories such as race, ethnicity, gender and nationality but there are many thousands of other social identities (Haslam et al., 2012).

Being mindful of social identities influences our thoughts, feelings and behaviours (Postmes et al., 2005). The Social Identity Approach is a family of related theories helping us to understand and explore these influences. Social Identity Theory and Self-Categorization Theory are the key members of the family. Together they make up the Social Identity Approach.

Social Identity Theory (Tajfel, 1974, Tajfel, 1969) explains how bias and discrimination occurs within/between social groups. Tajfel originated this theory arguing groups are an important source of self-esteem. This was evidenced when people, assigned to random and relatively meaningless groups, showed a bias towards their group and prejudice against another group (Tajfel, 1974).

Self-Categorization Theory (Turner et al., 1987) was developed to explain the psychological processes described by Tajfel. Turner said, we hold cognitive representations of social groups as prototypes. These prototypes are shared in the minds of members of a given social group (Hogg and Reid, 2006). Based on these prototypes, we firstly define ourselves and others as members of a given group, according to the social context. Next, we identify with our group and align our thinking to the perceived thoughts and behaviours associated with that group (the social norms). Thirdly, we then compare our group with another, based upon prototypes of each group, favouring the group to which we belong.

In the context of learning and teaching, social identification is important because it is the process by which we engage with and internalise the social world (Postmes et al., 2005, Turner, 1991, Turner et al., 1987). This provides one psychological explanation of Vygotsky's account of internalisation (Vygotsky, 1978).

THE SOCIAL IDENTITY APPROACH APPLIED TO CLICKERS

Using the clicker models above, this section seeks to map the Social Identity Approach onto the technology. For each sub-section, we highlight key features of the models and present related aspects of the theory. The sections are:

1. Dialogue and Interaction
2. Voting Options as Attributes of the Group
3. Anonymity, Visual Representation and Deindividuation
4. Group Identity and Saliency
5. Developing Shared Cognition
6. Evidence of Social Influence

1. Dialogue and Interaction

Dialogue and interaction can function at either of 2 levels. It may serve as a form of inter-personal exchange remaining at the individual level of interaction. Alternatively, at a meta-level, the discussion may reference normative content relating to social-group membership.

We know discussion and communication can induce a sense of group identity amongst participants (Hogg and Reid, 2006, Postmes et al., 2005). Dialogue and interaction can determine the choice of which identity is explored together. This happens through a process of negotiation as to which social category is to be made salient (Hogg and Reid, 2006). In this way, conversations can be a way of grounding normative group-related content in the immediate context. This means thinking 'as members' of a shared social group and norms being modified within the conversation.

Peer Instruction begins with students voting on items generated by the tutor. This is followed by dialogue to share and make sense of beliefs to do with responses. Research elsewhere tells us consensus rises significantly following discussion (Postmes et al., 2005). This effect is heightened when the group identity is salient. This may mean the initial vote generates a level of consensus in the minds of individuals. This, in turn, may become the focus of the ensuing dialogue.

SharedThinking begins with dialogue and interaction on matters relevant to the group, discipline etc. Small groups reach consensus about which idea to put forward to the rest of the class. However, any wider consensus is unknown until after the voting. In addition, SharedThinking does not seek consensus as an outcome. There is no right answer in this model.

It is reasonable to suggest both Peer Instruction and SharedThinking will develop a shared sense of group-awareness through dialogue and interaction. Both help to break down inter-psychological barriers. The discussion of group-relevant issues should mean both models will move beyond the inter-personal level of interaction.

2. Voting Options as Attributes of the Group

Self-Categorization Theory suggests a sense of group-membership is generated in a comparison with an out-group. It is however possible to generate a sense of belonging to a social group (social identification) without making an outgroup comparison (Postmes et al., 2005, Swaab et al., 2007). This can be done in two ways using either a deductive or an inductive strategy (Hogg and Reid, 2006).

Peer Instruction begins with students voting on readymade options. There is no discussion at this point. One outcome is the visualisation in the display of aggregated votes. This should make the situated group salient in the minds of participants because it displays the thoughts of the group quickly and in a coherent way (showing what 'we' think about the tutor's proposed answers). This is a largely deductive approach.

SharedThinking may generate social identification using a slightly different route. This happens via an inductive process. Participants generate the voting options from small group discussions in response to a framing question posed by the tutor. The technology is used to display the options as they are built slowly together offering more time for reflection. The set of inputs is then used as a basis for polling and the results are displayed quickly in a similar way. The generative combination of the visual and the dialogical should induce a group identity. The model generates a view of what 'we' think about 'our' options

Both Peer instruction and SharedThinking would be consistent with the process of creating a social group identity. Both models involve dialogue and visualising the collective view. The focus of the dialogue is either based upon top-down attributes (Peer-Instruction) or upon bottom-up attributes (SharedThinking). Both models suggest the displayed results may function as ad-hoc group norms.

3.   Anonymity, Visual Representation & Deindividuation

In online settings, anonymity reduces awareness of the self and others as individuals (Postmes et al., 2001). This *deindividuation* effect increases the tendency to see others in terms of their social-group identities.

Anonymity is a common feature of using clickers. Anonymity allows participants to respond without social or psychological risk when learners are unsure of an answer (Draper, 2004). Anonymity allows less powerful group members to communicate with reduced fear (Postmes and Brunsting, 2002, Spears et al., 2002, Postmes et al., 2001). This is true with small groups in classrooms when members already know each other (Draper, 2004).

Both Peer Instruction and SharedThinking display votes anonymously. This is likely to cause de-individuation and raise group-consciousness amongst the participants. The display is what 'we' think as a group and individuals are likely to relate as group-members rather than as individuals.

4. Group Identity & Saliency

"*The capacity for cognition to be shared is only realised to the extent that a shared social identity is salient*" (Postmes et al., 2005). This suggests a social category must be active for input to be 'heard.' Effective communication may be dependent upon a socially shared identity being salient in the immediate context. Such a view has implications for learning and for teaching. Learners may be psychologically deaf to input outside the salient normative view. They may not therefore be teachable if the group identity is not both personally-relevant and situationally salient.

Peer Instruction is likely to generate a sense of group-awareness, as will general use of clickers. The display of aggregated results seems likely to make the group salient in participants' minds. The content is group-relevant.

The display raises collective awareness of the group-level view even when based on the options created by the tutor.

SharedThinking should likewise make the group salient. It involves participants generating options from within the group through dialogue and interaction. This saliency is likely to be maintained and heightened by the subsequent display of results. The group-identity is made salient and its associated co-constructed norms are known and made public.

5. Developing Shared Cognition

According to Thompson and Fine (Thompson and Fine, 1999, Swaab et al., 2007), shared mental models are common frameworks of interpretation held by group members. These are ways in which members may each think about group-relevant tasks. Shared social representations are the beliefs we have that others in the group hold similar views (Thompson and Fine, 1999). Without this, cooperation becomes more difficult. We must believe others hold similar knowledge for communication to make sense (Swaab et al., 2007).

Peer Instruction uses tutor-generated options and facilitates discussion as participants work towards the correct answer. The display of votes provides an interpretive framework showing areas of consensus and disagreement around key concepts.

SharedThinking uses student-generated options. The aim is to develop understanding but not consensus. The votes provide an interpretive framework but contribute to development of a critical perspective (Bowskill, 2017b).

Clickers make thinking visible and public in the room. Every participant is made aware of the level of consensus (Peer Instruction) and difference (SharedThinking) within the group. SharedThinking may normalise the views of individual group members in the social context of the group (Draper, 2009). Both models support the development of shared mental models and shared social representations.

6. Evidence of Social Influence

When individuals are mindful of their social group membership, they relate their thinking to the perceived norms for the salient group identity (Bicchieri and Mercier, 2014, Livingstone et al., 2011, Neighbors et al., 2010, Hogg and Reid, 2006). Social norms are the beliefs, behaviours and practices associated with a given social group. They are the *content* of social identities.

These group norms serve as a guide and a source of influence for members in group-relevant situations (Haslam et al., 2011). They tell us how we *should* behave in group-relevant situations. This explains why we align our thoughts, feelings and behaviours to them when the given identity is salient (Hogg and Reid, 2006, Livingstone et al., 2011).

Research on Peer Instruction suggests students are influenced by the views of their peers. Students tend to select the answer with the greatest consensus (Vickrey et al., 2015). When individual views match the consensus-view student confidence increases. This is regardless of whether the consensus answer is correct (Brooks and Koretsky, 2011). In Peer Instruction, the initial vote and display is followed by discussions amongst peers. Research done by Mazur and others has shown significant tendencies to change towards the most popular answer in the first vote (Nicol and Boyle, 2003, Crouch and Mazur, 2001). The suggestion made in this paper is the first vote in Peer Instruction makes salient the group identity and these influences are the product of social identification.

SharedThinking research suggests participants are also influenced by their peers. Individuals get new ideas and feel inclined towards the views of others. This occurs in the process of co-constructing the options as well as in consequence of seeing the final display of votes. Participants also gain confidence from talking with like-minded others and it supports individual decision making (Bowskill, 2017b). These findings are symptomatic of social identification.

CONCLUSION

The aim of this paper was to develop theory for this technology which connects with existing literature on education and psychology. This is a response to calls by Penuel and others (above) to build on disciplinary work and theoretical frameworks developed in empirical research. This paper presented and explored the idea of social identity theory as a theory of learning for clickers. Based on the above, we can identify the following assumptions about clickers based on a social identity approach:

- Anonymity in the voting process should cause deindividuation
- The display of aggregated votes generates entitativity (a sense of togetherness or groupness) and group-consciousness
- Users of this technology co-construct a common group identity made salient through dialogue and interaction
- The *catalytic* effect (Draper, 2009, Draper and Brown, 2004) of clickers is social identification invoking an immediate sense of belonging to the situated social group as a salient social identity.
- A common group identity is either created via an inductive process (with co-constructed options - SharedThinking) or a more deductive process (with pre-determined options - Peer Instruction).

Some studies argue the impact and outcomes of using clickers is less attributable to the technology and more to do with the pedagogy (Lasry, 2008, Crouch and Mazur, 2001, Draper and Brown, 2004). Different models discussed in this paper support such a view. This paper goes further and argues the theoretical framework used to design learning is at least as important.

More work is needed to explore all models of clicker practice (more so on SharedThinking as a relatively new model) using this theoretical framework. This framework should be extended to the use of other learning technologies. In such cases, research is needed to develop the social group as the unit of learning. More research is needed to explore the idea of the social identity approach as a theory of learning, with or without technology and work is already being done elsewhere to address this (Bliuc et al., 2011, Burford, 2012). More work is needed to understand learning applications of this social psychological framework to complement existing work using sociocultural theories.

Interestingly, other researchers have argued for different mediators of learning to be considered for pedagogical design. Technology and networks (Siemens, 2005), language (Wertsch, 1980, Vygotsky, 1978), activities and tools (Engeström, 2007) and communities (Wenger, 1998, Lave and Wenger, 1991, Roschelle et al., 2004) have all been used to explain learning. This paper proposes the addition of '*identity-mediated group learning*' (Bowskill, 2017b) in which the situated group-identity provides the basis for development using a social identity approach.

Finally, one researcher describes the use of this technology as having a '*catalytic*' effect (Draper, 2009). Another notes the '*sense of community*' as an affective outcome arising from the use of this technology (Simon et al., 2013). In this paper, the suggestion is the 'catalytic' effect may be the moment of social identification when the group is made salient and the deindividuation occurs. From this, we affirm the view elsewhere in the literature that '*reference to peers has more influence than reference to facts*' (Goldstein et al., 2008).

References

BICCHIERI, C. & MERCIER, H. 2014. Norms and Beliefs: How Change Occurs. *The Complexity of Social Norms.* Springer.

BLIUC, A.-M., ELLIS, R. A., GOODYEAR, P. & HENDRES, D. M. 2011. Understanding student learning in context: relationships between university students' social identity, approaches to learning, and academic performance. *European Journal of Psychology of Education,* 26**,** 417-433.

BOSCARDIN, C. & PENUEL, W. 2012. Exploring Benefits of Audience-Response Systems on Learning: A Review of the Literature. *Academic Psychiatry,* 36**,** 401-407.

BOWSKILL, N. 2013. *A Social Identity Approach To Learning With Classroom Technologies.* PhD Doctoral, University of Glasgow.

Proceedings of the 11th International Conference on
Networked Learning 2018, Edited by: Bajić, M,
Dohn, NB, de Laat, M, Jandrić, P & Ryberg, T

ISBN 978-1-86220-337-2

405

BOWSKILL, N. 2017a. SharedThinking and Collective Inquiry: A new model for Clickers. *10th Annual University of Glasgow Learning and Teaching Conference.* University of Glasgow.

BOWSKILL, N. 2017b. SharedThinking: A Social Identity Approach to Critical Thinking. *Journal of Pedagogical Development, 7,* 37-46.

BOWSKILL, N. & BRINDLEY, S. 2009. Shared Thinking for PDP Support. *9th Residential Seminar of the Centre for Recording Achievement.* Chancellors Hotel and Conference Centre, Manchester, UK.

BOWSKILL, N., BRINDLEY, S., CUTTS, Q., LALLY, V. & DRAPER, S. 2010a. Shared Thinking as a Community Model of Induction and Transition. *Global Learn 2010.* Penang, Malaysia.

BOWSKILL, N., CUTTS, Q., BRINDLEY, S., LALLY, V. & DRAPER, S. 2010b. "Am I Alone in Thinking..?" Overcoming student concerns and isolation using a Shared Thinking approach for FIMS Induction. *3rd Annual University of Glasgow Learning and Teaching Conference.* University of Glasgow.

BOWSKILL, N., LALLY, V., DRAPER, S., BRINDLEY, S. & CUTTS, Q. 2010c. Shared Thinking as Whole-Group Enquiry: New Pedagogical and Methodological Practices. *2nd Meeting of ESCTICT.* eScience Institute, University of Edinburgh, Scotland.

BROOKS, B. J. & KORETSKY, M. D. 2011. The Influence of Group Discussion on Students' Responses and Confidence during Peer Instruction. *Journal of Chemical Education, 88,* 1477-1484.

BURFORD, B. 2012. Group processes in medical education: learning from social identity theory. *Medical Education, 46,* 143-152.

CROUCH, C. H. & MAZUR, E. 2001. Peer Instruction: Ten years of experience and results. *American Journal of Physics, 69,* 970-977.

DRAPER, S. W. 2009. Catalytic assessment: understanding how MCQs and EVS can foster deep learning. *British Journal of Educational Technology, 40,* 285-293.

DRAPER, S. W. & BROWN, M. I. 2004. Increasing interactivity in lectures using an electronic voting system. *Journal of Computer Assisted Learning, 20,* 81-94.

ENGESTRÖM, Y. 2007. Enriching the Theory of Expansive Learning: Lessons From Journeys Toward Coconfiguration. *Mind, Culture, and Activity, 14,* 23-39.

GOLDSTEIN, N. J., CIALDINI, R. B. & GRISKEVICIUS, V. 2008. A Room with a Viewpoint: Using Social Norms to Motivate Environmental Conservation in Hotels. *Journal of Consumer Research, 35,* 472-482.

HASLAM, S. A. 2004. *Psychology in organizations: the social identity approach,* London, Sage.

HASLAM, S. A., REICHER, S. & PLATOW, M. 2011. *The new psychology of leadership: identity, influence, and power,* Hove and New York, Psychology Press.

HASLAM, S. A., REICHER, S. D. & REYNOLDS, K. J. 2012. Identity, influence, and change: Rediscovering John Turner's vision for social psychology. *British Journal of Social Psychology, 51,* 201-218.

HOGG, M. A. & REID, S. A. 2006. Social identity, self-categorization, and the communication of group norms. *Communication Theory, 16,* 7-30.

KARTSONAKI, E., BAILEY, C. & LAWRIE, G. A. iPass: Online collaborative peer-assisted study support. The Australian Conference on Science and Mathematics Education (formerly UniServe Science Conference), 2015.

LASRY, N. 2008. Clickers or Flashcards: Is There Really A Difference? *The Physics Teacher, 46,* 242-244.

LAVE, J. & WENGER, E. 1991. *Situated Learning. Legitimate peripheral participation* Cambridge, University of Cambridge Press.

LIVINGSTONE, A. G., HASLAM, S. A., POSTMES, T. & JETTEN, J. 2011. "We Are, Therefore We Should": Evidence That In-Group Identification Mediates the Acquisition of In-Group Norms. *Journal of Applied Social Psychology, 41,* 1857-1876.

Proceedings of the 11th International Conference on Networked Learning 2018, Edited by: Bajić, M, Dohn, NB, de Laat, M, Jandrić, P & Ryberg, T

ISBN 978-1-86220-337-2

406

MAYER, R. E., STULL, A., DELEEUW, K., ALMEROTH, K., BIMBER, B., CHUN, D., BULGER, M., CAMPBELL, J., KNIGHT, A. & ZHANG, H. 2009. Clickers in college classrooms: Fostering learning with questioning methods in large lecture classes. *Contemporary Educational Psychology,* 34**,** 51-57.

NEIGHBORS, C., LABRIE, J. W., HUMMER, J. F., LEWIS, M. A., LEE, C. M., DESAI, S., KILMER, J. R. & LARIMER, M. E. 2010. Group identification as a moderator of the relationship between perceived social norms and alcohol consumption. *Psychology of Addictive Behaviors,* 24**,** 522-528.

NICOL, D. J. & BOYLE, J. T. 2003. Peer instruction versus class-wide discussion in large classes: a comparison of two interaction methods in the wired classroom. *Studies in Higher Education,* 28**,** 457-473.

PENUEL, W. R., ABRAHAMSON, L. & ROSCHELLE, J. 2006. Theorizing the Transformed Classroom: A Sociocultural Interpretation of the Effects of Audience Response Systems in Higher Education. *In:* BANKS, D. (ed.) *Audience Response Systems in Higher Education: Applications and Cases.* Hershey, PA: Information Science Publishing.

POSTMES, T. & BRUNSTING, S. 2002. Collective Action in the Age of the Internet. *Social Science Computer Review,* 20**,** 290-301.

POSTMES, T., HASLAM, S. A. & SWAAB, R. I. 2005. Social influence in small groups: An interactive model of social identity formation. *European Review of Social Psychology,* 16**,** 1-42.

POSTMES, T., SPEARS, R., SAKHEL, K. & DE GROOT, D. 2001. Social Influence in Computer-Mediated Communication: The Effects of Anonymity on Group Behavior. *Personality and Social Psychology Bulletin,* 27**,** 1243-1254.

ROSCHELLE, J., PENUEL, W. & ABRAHAMSON, L. 2004. Classroom response and communication systems: Research review and theory. Paper presented at the Annual Meeting of the American Educational Research Association.

SIEMENS, G. 2005. Connectivism: A Learning Theory for the Digital Age. *International Journal of Instructional Technology and Distance Learning,* 2.

SIMON, B., ESPER, S., PORTER, L. & CUTTS, Q. Student experience in a student-centered peer instruction classroom. Proceedings of the ninth annual international ACM conference on International computing education research, 2013. ACM, 129-136.

SPEARS, R., LEA, M., CORNELIUSSEN, R. A., POSTMES, T. & HAAR, W. T. 2002. Computer-Mediated Communication as a Channel for Social Resistance. *Small Group Research,* 33**,** 555-574.

SWAAB, R., POSTMES, T., VAN BEEST, I. & SPEARS, R. 2007. Shared cognition as a product of, and precursor to, shared identity in negotiations. *Personality and Social Psychology Bulletin,* 33**,** 187-199.

TAJFEL, H. 1969. Cognitive aspects of prejudice. *Journal of Social Issues,* 25**,** 79-97.

TAJFEL, H. 1974. Social identity and intergroup behaviour. *Social Sciences Information/Information sur les Sciences Sociales,* 13**,** 65-93.

THOMPSON, L. & FINE, G. A. 1999. Socially shared cognition, affect, and behavior: a review and integration. *Pers Soc Psychol Rev,* 3**,** 278-302.

TURNER, J. C. 1991. *Social Influence,* Milton Keynes, Open University Press.

TURNER, J. C., HOGG, M. A., OAKES, P. J., REICHER, S. D. & WETHERELL, M. S. 1987. *Rediscovering the social group: A self-categorization theory*, Basil Blackwell.

VICKREY, T., ROSPLOCH, K., RAHMANIAN, R., PILARZ, M. & STAINS, M. 2015. *Research-Based Implementation of Peer Instruction: A Literature Review*.

VYGOTSKY, L. S. 1978. *Mind in Society: The development of higher psychological processes,* Cambridge, MA, Harvard University Press.

WENGER, E. 1998. *Communities of Practice: Learning, Meaning and Identity,* Cambridge, Cambridge University Press.

Proceedings of the 11th International Conference on
Networked Learning 2018, Edited by: Bajić, M,
Dohn, NB, de Laat, M, Jandrić, P & Ryberg, T

ISBN 978-1-86220-337-2

407

WERTSCH, J. V. 1980. The Significance of Dialog in Vygotsky's Account of Social, Egocentric, and Inner Speech. *Contemporary Educational Psychology,* 5**,** 150-74.

YAOYUNEYONG, G. & THORNTON, A. 2011. Combining peer instruction and audience response systems to enhance academic performance, facilitate active learning and promote peer-assisted learning communities. *International Journal of Fashion Design, Technology & Education,* 4**,** 127.

Proceedings of the 11th International Conference on
Networked Learning 2018, Edited by: Bajić, M,
Dohn, NB, de Laat, M, Jandrić, P & Ryberg, T

ISBN 978-1-86220-337-2

408