

Individual Reflection Papers as a Means to Support Individual Assessment in Group Examinations in Problem-Based Learning

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Abstract

Even though using group examinations aligns well with the epistemology of problem-based learning (PBL), the dilemma of using joint learning while simultaneously fulfilling individual assessment requirements in higher education make group examinations difficult to use. In this study, the aim was to explore whether an individual reflection paper (IRP) can act as a means to support individual assessment in group examinations in PBL. 152 IRPs were used to assess whether a particular group of students had acquired theoretical and analytical knowledge that would affect results on a group examination. Overall, completed IRPs clearly showed a concurrence between the students' acquired and requested theoretical and analytical knowledge on the examination, except on a few occasions. These findings are promising and suggest that IRPs can act as a means to support individual assessment in group examinations in PBL and that it is possible to combine joint learning in tutorial groups with individual group work assessment.

Keywords: Individual reflection paper, group exams, problem-based learning, group work assessment

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Introduction

This study is based on the idea that tutorial groups in problem-based learning (PBL) offer valuable opportunities for in-depth learning with others (Azer & Azer, 2015; Yew & Goh, 2016) but that the requirement for teachers to assess students' engagement and knowledge contributions individually may result in counterproductive competitive processes (Hammar Chiriac & Forslund Frykedal, 2023; Orr, 2010). The facilitation of joint learning while simultaneously fulfilling the requirements in higher education of individual assessment results in a dilemma entailing that group examinations become challenging to use. Managing this paradox and exploiting the potential of group examinations, depends on finding methods or tools that can contribute to more justifiable group work assessment. One of these tools might be individual reflection papers (IRPs; Abrandt Dahlgren et al., 2016; Johansson et al., 2012; Johansson & Svensson, 2019), a structured method requiring a student's written reflections on knowledge acquired and aspects of it to discuss at the student's next tutorial meeting. Against this backdrop, the aim of this study was to explore whether an IRP can act as a means to support individual assessment in group examinations in PBL.

Collaborative Learning and PBL

Collaborative learning is an effective pedagogical tool that provides students with knowledge and skills they will need in their future professional activities (Barnett, 2012; Johnson & Johnson, 2014; Tan et al., 2017). This aligns well with the fundamental principle of using PBL which is to equip the students with an investigative approach and to develop a greater sense of responsibility for their own learning (Jones, 2013; Wiggins et al., 2016). The main processes of PBL are problem-solving, self-directed learning, and group interaction (Moallem et al., 2019; Savin-Baden & Howell, 2004). PBL uniquely provides opportunity for collaborative learning in small tutorial groups. Well-functioning tutorial group work promotes both subject theoretical and analytical knowledge and encourages the development of collaborative skills. In PBL, students use the tutorial group both as a means (a base for learning and academic achievement) and an objective (learning collaborative abilities; Hmelo-Silver, 2004; Rosander & Hammar Chiriac, 2016). Because the tutorial groups provide valuable opportunities for in-depth learning with others, the conditions match well with the possibility of using group examinations given that such examinations not only serve as a basis for assessment but also provide additional opportunities for joint learning (Hammar Chiriac & Forslund Frykedal, 2023).

Group Work Assessment in Tutorial Groups

When tutorial groups are used in PBL in higher education the teachers are obliged to assess the students' individual knowledge, which is constructed in interaction with others. A recurring challenge for teachers is to be able to distinguish and collect evidence to assess individual students' knowledge from the tutorial group's jointly produced knowledge (Dijkstra et al., 2016; van Aalst, 2013). The requirement for teachers to assess students' individual may result in counterproductive competitive processes (Hammar Chiriac & Forslund Frykedal, 2023). Students sometimes also experience group work assessment as problematic because it is often associated with the experience of injustice and unequal contribution (Orr, 2010). Combining group work assessment with collaboration and joint learning in tutorial groups is therefore problematic for both teachers and students. In fact, some researchers have questioned whether well-functioning group work linked to individual assessment exists at all (Steel et al., 2014). The dilemma of facilitating joint learning while fulfilling the requirements of individual assessment means that group examinations become difficult to use. Managing this dilemma, and to take advantage of the potential of using group examinations in PBL, depends on finding methods or tools that can contribute to more justifiable individual group work assessment. One of these tools might be IRPs (Abrandt Dahlgren et al., 2016; Johansson et al., 2012; Johansson & Svensson, 2019).

Individual Reflection Papers in PBL

An IRP is a structured method intended to support the development of the student's active approach to learning and ability for reflection and to facilitate their learning process (Abrandt Dahlgren et al., 2016; Johansson et al., 2012; Johansson & Svensson, 2019). The use of IRPs has successfully been implemented in PBL programmes and concerns knowledge acquisition and processing on both individual and group level. The IRP processes include three steps where the first two steps concern students' preparations and learning at the individual level between the tutorial group meetings, and the third step regards the discussion and in-depth learning at the group level at the meeting (Johansson & Svensson, 2019, p. 99). More specifically, in the first step of the IRP process each student, individually between the tutorial meetings, documents and compiles a written short text including (a) their subject theoretical acquired knowledge based on the group's jointly formulated learning needs and question, (b) reflections on their own learning process and (c) aspects of it to discuss at the next tutorial meeting (analytical knowledge). In the second step, all students in the tutorial group individually read each other's IRPs. In the third step, the students meet in the tutorial group and conduct a collective discussion based on the group's jointly gathered knowledge expressed in the IRPs (i.e., develop subject theoretical and analytical knowledge

and collaborative skills on group level). Previous experience and research on PBL have shown that the use of IRPs can act as a support for students' preparation for and learning in tutorial groups on both individual and group level (Johansson & Svensson, 2019). It also appears that IRPs can facilitate tutors' assessments and examinations of students' individual engagement and contributions in tutorial groups (Johansson et al., 2012).

In sum, an IRP is an individual written elaboration of theoretical and analytical knowledge acquisition. It serves as a preparation for tutorial group discussions because each student summarises how they understand the theories and research findings that they want to discuss at the next group meeting.

The Present Study

This study is based on a few years' experience using IRPs as a tool for supporting group work assessment in group examinations in PBL. The aim of the study was to explore whether an IRP can act as a means to support individual assessment in group examinations in PBL.

Materials and Methods

The context of this study was the psychologist programme (Master of Science in Psychology) at a large university in Sweden that uses PBL. IRPs was implemented in the last of four group and social psychology courses in the programme. The current course was structured around three themes corresponding to important research areas in group and social psychology: (a) conflict management and conflict escalation, (b) bullying and abusive treatment in the workplace, and (c) group development. The purpose of using IRPs in the course was two-folded; firstly, to give the students an opportunity to try a new tool to support their learning process and promote their ability to reflect on their own understanding and learning (cf. Abrandt Dahlgren et al., 2016; Johansson & Svensson, 2019) and secondly to facilitate teachers individual group work assessment in PBL. The use of the IRPs was a part of the regular coursework and included students' individually writing three IRPs, one for each of three themes in the course. Each IRP contained a written short and concise description of the student's acquired subject knowledge, theories and research findings linked to references and an elaboration of the understanding of theories and research findings that they wanted to discuss at the next tutorial meeting (Abrandt Dahlgren et al., 2016). The students' IRPs were submitted prior to the tutorial group meeting and served as an individual preparation for

the collective group discussions (group level). Because the IRPs were restricted to 2,000 words, excluding references, the students had to choose what they thought was most important to convey and therefore be included. The submitted IRPs, as well as the students' active participation in the tutorial group were assessed by the tutors. In this way, both individual understanding and processual reflections were captured. What was new and tried for the first time was that one of each student's submitted IRPs was reused in connection with the group examination. As far as I know this is the first study focusing on exploiting the possibility of reusing submitted IRPs as a means for supporting group work assessment in group exams.

Group Examinations in the Tutorial Groups

At the end of the course, the students' theoretical and analytical knowledge acquisition was assessed through a group examination that was carried out over the course of a day (8:00–17:00) on site at the university. The group examination was based on one of the three themes in the course (i.e., conflict management and conflict escalation, bullying and abusive treatment in the workplace, or group development). Which theme was addressed in the examination was predetermined by the teacher and revealed to the students in the task description on the day of the examination. The task consisted of the tutorial group jointly solving a task based on a vignette. On the basis of the vignette and the instructions (Figure 1), the group jointly selected and defined a problem formulation or question that should be processed, analysed, and applied on the basis of chosen relevant group and/or social psychological theories and research findings regarding the 'theme' addressed in the examination.

The examination task must be solved by the tutorial group together. The tutorial group must function as a work group with a specific task, namely, to solve the examination task described below. The task description includes a vignette that you will work with during the day. The vignette consists of [...] You must use the vignette as a starting point for your work and it must be analysed from a group perspective and focus on [one of the three themes]



Based on the vignette, you should:

- Conduct a brainstorming.
- Define and choose a problem formulation or a question.
- Process the problem formulation by analysing it based on relevant theories and research findings on [...]. Remember to formulate your question so that all participants in the group have the opportunity to contribute in terms of knowledge.
- Apply the processing to the specific situation in the vignette. In this practical application, you must use the theories and research findings you have chosen to highlight in the processing (don't forget references in the application). Also connect back to your problem formulation.
- Evaluation. You must jointly evaluate your work in the tutorial group, evaluating how the collaboration worked and each student's contributed to the work. It is not enough to simply state that everyone has contributed equally, but you must reason about each person's knowledge contribution and how the group and the group's work functioned during the day. In order to be able to assess each individual's possible knowledge contribution, the IRP of all group participants must be attached to the examination. NOTE that no new IBUs should be written, but you should reuse the IBU that is relevant for the group examination and that you previously submitted in connection with [..]



Thus, there are five steps that are included in the task and that must be reported in writing. The focus of the examination is to process and analyse the problem formulation theoretically and apply the processing to the vignette.

Figure 1. Task description and framework for the group examination.

Note: [...] is omitted text that corresponds to concepts that vary for the specific examination.

The students were reminded about the importance of formulating a problem or question that all participants in the group had the opportunity to contribute in terms of knowledge. This working method was well known to the tutorial group because it was created by means of the same problem-solving process that the tutorial groups usually used at their meetings. Notes and optional literature were allowed to be used during the work. The group examination was graded on a two-part scale: pass or fail. (To gain a higher grade, pass with merit, the student had to take an individual written examination as well.)

Data Sources

The use of IRPs as a means to assess group examinations was implemented in a course in the psychology programme 2020 and is still used. The data for this study were taken from the years 2020–2022. In total, 11 tutors assessed and approved 465 IRPs submitted by students. One hundred fifty-two (152) IRPs were reused in 21 group examinations, of which there are seven per year. A requirement for passing the group examination was active participation in and contribution to the common product of the tutorial group. To show possible individual knowledge contribution of relevance to the examination, all students were obligated to attach the IRP produced for the theme that the examination addressed. No new IRPs were written, but the students reused one of their previously submitted IRPs. In sum, 152 pre-assessed and approved IRPs were reused as a basis to assess whether the student had acquired theoretical and analytical knowledge that could contribute to the examination. To further conceptualise the tutors' and students' apprehension of using IRPs as a means for supporting group work assessment in group exams, evaluations from tutors (2021) and the students' regular course evaluations (2020–2022) at course level were used as supporting documents.

To ensure all participants' integrity, the project was guided by an approach based on responsibility, reliability, honesty, and respect. Informed consent was retrieved from the 11 tutors included in the current cohorts. Because the data for this study were retrieved from the students' regular examinations in the course and not collected for research purposes, great importance was placed on their integrity and anonymity in all parts of the written report, both emphasising the concern for students' interests and their right to confidentiality (cf. British Psychological Society, 2014; Swedish Research Council, 2017). All findings that may be derived from the students' examinations, or their evaluation, are provided at group or course level and anonymised. The focus is not on describing the opinions or experiences of individual students but on describing an innovative and new approach to group examinations and group work assessment in PBL.

Findings

The findings are mainly based on my evaluation of the outcome of using IRPs as a means to support individual assessment in group examinations in PBL in higher education. In connection with assessing the group product, I read through all the attached IRPs and assessed whether the individual student had written about acquired knowledge aligned with theories and research findings processed in the joint (tutorial group) product. By focusing on the individual level of the IRPs consisting of the students' short and concise description of their

acquired subject knowledge, theories and research findings linked to references and their reflection on their own understanding and learning reported in the IRP, I could compare each student's reported own theoretical and analytical knowledge contribution (IRP) with the tutorial group's joint product. Figure 2 depicts an anonymised and simplified example of how an analysis of individual participants' reported knowledge matched the knowledge the tutorial group jointly presented in the examination task regarding group development. The students in the tutorial group had each, in their respective IRP, reported acquired knowledge on a variety of group development theories (illustrated in the figure with the names of the originators). Some of these theories and research findings (but not all) were then reused to solve the examination task. In the left part of the figure, the students' acquired knowledge and research findings on group development theories are presented on the basis of the originators of each theory. The arrows depict how the knowledge from each student partially matches the theoretical and analytical knowledge needed to answer the group's problem formulation.

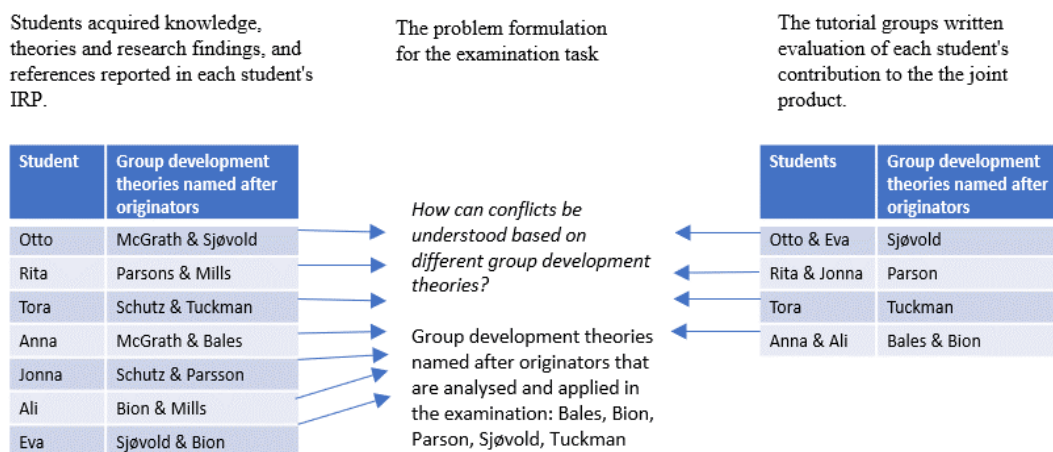


Figure 2. Assessment process, including information from students' individual reflection papers (IRPs) and the tutorial group joint evaluation (modified to maintain integrity for the participants).

In that way, I was able to determine the extent to which each of the group members had opportunity to contribute newly acquired knowledge to the content of the examination.

Overall, the completed IRPs clearly showed concurrence between the students' acquired and requested knowledge on the examination. On a few occasions, however, it was difficult to find the connection between single IRPs and possible knowledge contributed to the examination. On these occasions, I turned to the group's written evaluation of the group's work and process during the day (i.e., the last part of the task; see Figure 1). The group's

evaluation generally included a brief account of how the work was structured; whether there were any formal roles and, if so, who held the role; and, if the task had been divided, who contributed with which part and how the collaboration worked during the day. A discussion of each person's knowledge contribution and how the group and the group's work functioned during the day was also included. The following excerpts are examples from three anonymous tutorial groups.

We started by appointing a chairman and secretary to facilitate the brainstorming and the design of the question. The IRPs from the previous vignette were the basis for formulation of the question and distribution of the tasks during the day, so that everyone would be able to contribute with the knowledge we [had] gathered during the course. (Anonymous Tutorial Group 1)

The cooperation in the group has been perceived to have worked well, with clear and open communication which facilitated layout and structuring. Everyone in the group was well prepared which made the writing itself efficient as not too many new sources were needed . . . we had elaborated and informative IRPs available. (Anonymous Tutorial Group 2)

In the theory part, everyone contributed with a paragraph on selected theories and models. Otto and Eva described Sjøvold's theory, Rita and Jonna wrote about Parson's theory, Tora described Tuckman's theory and finally, Bales and Bion's theory was defined by Anna and Ali. The division was determined based on what each individual member had chosen to focus on in his IRP around the theme. (Anonymous Tutorial Group 3, modified to match the example in Figure 2)

The right column in Figure 2 shows how the tutorial group in the example divided the work of analysing and writing relevant theories and research findings reported in the examination task into subgroups. Each of the subgroups contributed knowledge based on their own experience in the course (illustrated by the arrows), and together all four subgroups added to the joint knowledge contribution and thereby completed the assignment.

The evaluations from tutors (2021) and the students' regular course evaluations (2020–2022) at the course level mainly concerned findings about the use of IRPs in general in the course. However, there were a few relevant feedback statements from teachers and students. For instance, the tutors highlighted that 'the students' knowledge contribution to the discussions in the tutorial groups could be more extensive than is addressed in the IRP'. The students were more frustrated with the connection between individual IRPs submitted during the course and the group examination: 'There was a lack of clarity about how [the

IRPs] should be connected to the group examination'. The students expressed that how clearly linked the IRPs would have been to the examination was a bit unclear.

Discussion

These results show that the use of IRPs can be a new approach to assess students' individual knowledge when using group examinations (Dijkstra et al., 2016; van Aalst, 2013). Hence, this study shows that it is possible to manage the paradox of facilitating collaborative and joint learning while fulfilling the requirements in higher education of individual assessment (Hammar Chiriac & Forslund Frykedal, 2023). Having said that, I would like to point out that there are challenges using group work assessment regardless of the pedagogical method. A recurring challenge for teachers using group work assessment is to be able to discern and collect empirical evidence for individual students' knowledge from the group's jointly shared knowledge (Dijkstra et al., 2016; Forsell et al., 2021; Meijer et al., 2020). Other prominent challenges are the risk of creating competition instead of collaboration between the students or assessing student's participation or contribution instead of knowledge (Hammar Chiriac & Forslund Frykedal, 2023).

By evaluating each student's submitted IRP and the students' joint evaluation in the group examinations, where they problematise knowledge contributions, collaboration, and their work and progress during the day (cf. Hmelo-Silver, 2004; Johansson et al., 2012; Rosander & Hammar Chiriac, 2016; Underwood, 2003), I obtained empirical evidence from two different levels and sources: (a) on an individual level, from each student's IRP, and (b) on a group level, from the tutorial group's joint written account. Together, these provided a good foundation for determining each student's potential for engagement in theoretical and analytical knowledge contribution to the group's shared product. It is important to remember that I was able to determine only whether the student had the potential for individual engagement and knowledge contribution based on the knowledge reported in the IRP and the group examination, not whether the student actually had been engaged and contributed knowledge.

The few statements of feedback from teachers and students that conceptualised their apprehension of reusing IRPs as a means for group work assessment in group examinations highlight some considerations to keep in mind. Because the IRPs were restricted in length, the teachers were concerned that students' knowledge contribution could be more extensive than conveyed in the IRP. Theoretical and analytical knowledge that becomes visible in the collective

discussion and learning (cf. Azer & Azer, 2015; Yew & Goh, 2016) may not count in comparison between the submitted IRP and the group examination. The students were frustrated over the ambiguity about the link between individual IRPs submitted during the course and the group examination. A possible interpretation is that the students were worried about the fairness of the group work assessment (Orr, 2010) if their respective IRP as not considered in connection with the group outcome.

Conclusions and Significance

The findings from this study contribute to science with their implication that it is possible to combine joint learning in tutorial groups with individual assessment. These results are promising and suggest that IRPs can act as a means to support individual assessment in group exams in PBL and, by extension, facilitate the use of group examinations in PBL. A pedagogical implication from this study is that using tutorial groups as a pedagogical tool in PBL in higher education does not only give students an excellent opportunity for joint in-depth learning and helps them develop the collaborative skills demanded by society but also opens for the possibility of using group examinations as a basis for assessment and additional opportunities for joint learning.

References

- Abrandt Dahlgren, M., Dahlberg, J., Ekstedt, M., Lind Falk, A., Sjögren, E., & Törnqvist, T. (2016). *PBL-guiden: En handbok för problembaserat lärande vid Medicinska fakulteten* [The PBL guide: A handbook for problem-based learning at the Faculty of Medicine]. <https://docplayer.se/32808445-Pbl-guiden-handbok-i-problembaserat-larande-for-studenter-och-larare-vid-medicinska-fakulteten.html>
- Azer, S. A., & Azer, D. (2015). Group interaction in problem-based learning tutorials: A systematic review. *European Journal of Dental Education* 19(4), 194–208. <https://doi.org/10.1111/eje.12121>
- Barnett, R. (2012). Learning for an unknown future. *Higher Education Research & Development* 31(1), 65–77. <https://doi.org/10.1080/07294360.2012.642841>

- British Psychological Society. (2014). *Code of human research ethics*.
<https://www.bps.org.uk/news-and-policy/bps-code-human-research-ethics-2nd-edition-2014>
- Dijkstra, J., Latijnhouwers, M., Norbart, A., & Tio, R. A. (2016). Assessing the “I” in group work assessment: State of the art and recommendations for practice. *Medical Teacher*, 38(7), 675–682.
<https://doi.org/10.3109/0142159X.2016.1170796>
- Forsell, J., Forslund Frykedal, K., & Hammar Chiriatic, E. (2021). Teachers’ perceived challenges in group work assessment. *Cogent Education* 8 (1).
<https://doi.org/10.1080/2331186X.2021.1886474>
- Hammar Chiriatic, E., & Forslund Frykedal, K. (2023). Individual group work assessment in cooperative learning: Possibilities and challenges. In R. Gillies, N. A. Davidson, & B. Mills (Eds.), *Contemporary global perspectives on cooperative learning* (pp. 94–108). Routledge.
<https://doi.org/10.4324/9781003268192-10>
- Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review*, 16(3), 235–266.
<https://doi.org/10.1023/B:EDPR.0000034022.16470.f3>
- Johnson, D. W., & Johnson, F. P. (2013). *Joining together: Group theory and group skill* (11th ed.). Allyn & Bacon.
- Johnson, D. W., & Johnson, R. T. (2014). Cooperative learning in the 21st century. *Annals of Psychology*, 30(3), 841–851.
<https://doi.org/10.6018/analesps.30.3.201241>
- Johansson, M., Sandén, P., & Johansson, A. (2012). Individuella basgruppsunderlag: Ett verktyg för synliggörande av individuell kunskapsinhämtning och bearbetning samt reflektion i basgruppsarbetet [Individual reflection paper: A tool for making visible individual knowledge acquisition and processing as well as reflection in tutorial group work]. In *CUL-Rapport 16* (pp. 122–136). Linköpings Universitet.
- Johansson, M., & Svensson, T. (2019). Individual reflection paper—Supporting students learning in the critical phase of self-directed learning in PBL. *Journal of Problem Based Learning in Higher Education*, 7(1), 97–106.
<https://doi.org/10.5278/ojs.jpblhe.v7i1.2418>
- Jones, S. (2013). Using problem-based learning for the acquisition of psychological knowledge and understanding. *Psychology Teaching Review*, 19(2), 38–48. <https://doi.org/10.53841/bpsptr.2013.19.2.38>
- Meijer, H., Hoekstra, R., Brouwer, J., & Strijbos, J. (2020). Unfolding collaborative learning assessment literacy: A reflection on current

- assessment methods in higher education." *Assessment & Evaluation in Higher Education* 45(8), 1222–1240.
<https://doi.org/10.1080/02602938.2020.1729696>
- Moallem, M., Hung, W., & Dabbagh, N. (Eds.). (2019). *The Wiley handbook of problem-based learning*. Wiley. <https://doi.org/10.1002/9781119173243>
- Orr, S. (2010). Collaborating or fighting for the marks? Students' experiences of group work assessment in the creative arts. *Assessment & Evaluation in Higher Education*, 35(3), 301–313.
<https://doi.org/10.1080/02602931003632357>
- Rosander, M., & Hammar Chiriatic, E. (2016). The purpose of tutorial groups: Social influence and the group as means and objective. *Psychology Learning & Teaching*, 15(2), 155–167. <https://10.1177/1475725716643269>
- Savin-Baden, M., & Howell, C. (2004). *Foundations of problem-based learning*. McGraw-Hill Education.
- Steel, A., Higgins, A., & Laurens, J. (2014). Valuable learning, unwelcome assessment: What LLB and JD students really think about group work. *Sydney Law Review*, 36(2), 291–221. <https://ssrn.com/abstract=2484379>
- Swedish Research Council. (2017). *Good research practice*.
- Underwood, J. D. M. (2003). Student attitudes towards socially acceptable and unacceptable group working practices. *British Journal of Psychology*, 94(3), 319–337. <https://doi.org/10.1348/000712603767876253>
- Tan, J. P.-L., Choo, S. S., Kang, T., & Liem, G. A. D. (2017). Educating for twenty-first century competencies and future-ready learners: research perspectives from Singapore. *Asia Pacific J. Education* 37(4), 425–436.
<https://doi.org/10.1080/02188791.2017.1405475>
- van Aalst, J. (2013). Assessment in collaborative learning. In C. E. Hmelo-Silver, C. A. Chinn, C. K. K. Chan, & A. M. O'Donnell (Eds.), *The international handbook of collaborative learning* (pp. 280–296). Routledge.
- Wiggins, S., Hammar Chiriatic, E., Larsson Abbad, G., Pauli, R., & Worell, M. (2016). Ask not only "What can PBL do for psychology?" but "What can psychology do for PBL?" A review of the relevance of problem-based learning for psychology teaching and research. *Psychology Learning & Teaching*, 15(2), 136–154. <https://doi.org/10.1177/1475725716643270>
- Yew, E. H. J., & Goh, K. (2016). Problem-based learning: An overview of its process and impact on learning. *Health Professions Education*, 2(2), 75–79.
<https://doi.org/10.1016/j.hpe.2016.01.004>