

## The Effect of Research Unit Clique-Diversity and Power Structure on Performance and Originality

**Authors :** Yue Yang, Qiang Wu, Xingyu Gao

**Abstract :** "Organized research units" have always been an important part of academia. According to the type of organization, there are public research units, university research units, and corporate research units. Existing research has explored the research unit in some depth from several perspectives. However, there is a research gap on the closer interaction between the three from a network perspective and the impact of this interaction on their performance as well as originality. Cliques are a special kind of structure under the concept of cohesive subgroups in the field of social networks, representing particularly tightly knit teams in a network. This study develops the concepts of the diversity of clique types and the diversity of clique geography based on cliques, starting from the diversity of collaborative activities characterized by them. Taking research units as subjects and assigning values to their power in cliques based on occupational age, we explore the impact of clique diversity and clique power on their performance as well as originality and the moderating role of clique relationship strength and structural holes in them. By collecting 9094 articles published in the field of quantum communication at WoSCC over the 15 years 2007-2021, we processed them to construct annual collaborative networks between a total of 533 research units and measured the network characteristic variables using Ucinet. It was found that the type and geographic diversity of cliques promoted the performance and originality of the research units, and the strength of clique relationships positively moderated the positive effect of the diversity of clique types on performance and negatively affected the promotional relationship between the geographic diversity of cliques and performance. It also negatively affected the positive effects of clique-type diversity and clique-geography diversity on originality. Structural holes positively moderated the facilitating effect of both types of factional diversity on performance and originality. Clique power promoted the performance of the research unit, but unfavorably affected its performance on novelty. Faction relationship strength facilitated the relationship between faction rights and performance and showed negative insignificance for clique power and originality. Structural holes positively moderated the effect of clique power on performance and originality.

**Keywords :** research unit, social networks, clique structure, clique power, diversity

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